



FRIDAY, MARCH 30.

Brake Shoes and Continuous Brakes for Freight Trains.

The March meeting of the Car-Builders' Club was held on Thursday evening, March 15, at the rooms in Liberty street, New York. The subject for discussion was announced by the President to be continuous brakes, freight car brakes, leverage, position of brake shoes on wheels, and number of shoes per car which will produce the most effective and economical results. He introduced Mr. GEORGE WESTINGHOUSE, JR., who said:

The use of continuous brakes has now extended over a period of 10 years, and has made most railroad men familiar with their general principles, as well as the advantages of their use. It is more important that passenger trains stop in a short distance than freight trains. To produce the best results on passenger trains it is necessary to apply the brakes to all the wheels of the train without any perceptible loss of time, and with exactly the degree of force that is necessary to produce the best results. The amount of force for the efficient working of the brakes was ascertained in some experiments which were made by myself and Captain Galton of England, and it was found that this force varied very much according to circumstances. At a speed of four or five miles an hour, an application of the brake shoes with a force equal to the weight on the wheels would cause the wheels to slide. At a speed of 60 miles an hour, a pressure equal to four times the weight on the wheels did not cause them to slide. It was also noticed that when brake shoes were first applied they appeared to hold a great deal more the first second than they did the next second. This decrease in holding power continued for a number of seconds, if the regular speed was maintained. The question of the proper application of brakes to wheels is a very complicated one. From many experiments which we made it was found that a pressure of about one and one-half times the load on the wheels produced the best results for high speeds. That is, a car weighing 30,000 lbs. required about 45,000 lbs. of brake-shoe force to produce the best results. With freight trains the problem is much more complicated, because the weight of the cars varies from 20,000 lbs. when empty up to 60,000 lbs. when loaded. To proportion the brake-shoes so that the pressure shall be in proportion to the weight of the car is almost an impossibility.

It was also found from the experiments made in England, that the ordinary coupling apparatus would not stand the strains produced by the full application of the brake. Owing to the slight irregularities in the action of the brakes, they are necessarily applied a little sooner in the front of the train than in the rear, and in consequence of this, the cars were jammed together. As soon as the brakes began to act with the same force on the rear of the train, it was stretched out, thus producing great strains on the couplings. This difficulty increased very much with the length of the train. If we undertook, with the present draw-bar appliance on freight trains, to apply the brakes with the same degree of force that is now used on passenger cars, it would be impossible to keep a long freight train together. In practice I have limited the braking force on each freight car to about nine-tenths of the weight of the empty car, and in that way have avoided altogether sliding of the wheels. In discussing the subject with railway officers I have been convinced that in order to provide for the breaking in two of trains, a freight train brake must be automatic in its action. On the Pennsylvania Railroad where they are now three freight trains fitted with my automatic brake, the officers first proposed to use the old non-automatic brake. But after careful consideration they concluded that it would be better to adopt an automatic brake, because their records show that on their heavy grades nearly all serious accidents arose from trains breaking in two. They therefore concluded that any brake which would not be applied by the separation of the train would be valuable in many instances.

Probably when we have much stronger couplings on freight trains which run at higher speeds it will be possible to increase the proportion of brake force for such trains and at the same time the load carried by the cars may be utilized for varying the leverage so that the brake force shall always be in the proportion of say nine-tenths of whatever the load of the car may be. I have given attention to making the body of the car act as a fulcrum for the levers, and a number of railroad people and inventors have taken out patents in relation to this.

With reference to the position of brake-shoes probably no two men would agree. You have all noticed the chattering of brake-blocks when you have been standing at a station and the train is being stopped. This result often occurs when the brake-shoes are about on the centre of the wheels. If you put the shoe about three or four inches below the centre of the wheel the chattering ceases. Experience in England showed that where a single block applied to each wheel it is a great deal better to put it from three to four inches below the centre, but when two blocks were used on each wheel then it was preferable to put them about half an inch below the centre.

The first experiments which I made with reference to the use of double shoes for each wheel showed conclusively that for some reason or other which I have not been able to fully explain, a given amount of cast iron will last a good deal longer than when one block for each wheel was used. The cutting action of the wheel on the brake-block seems to be in proportion to the pressure per square inch of surface.

There is a further advantage in the use of two blocks on each wheel. In applying the brake to one side of the wheel, taking the proportion of brake force I have given you, a wheel carrying a load of 5,000 lbs. would require 7,500 lbs. to be applied to the brake. Now the journal bearing is less than half the diameter of the axle, and thus the tendency of this immense force applied to one side of the wheels only is to shove the axles out of their bearings over against the boxes, which necessitates a much greater movement of the brake shoe, and as a consequence the piston of the cylinder in the case of the air-brake requires a stroke of from 9 to 12 in. for efficient braking. When the blocks are on both sides of the wheels it takes only 4 or 5 in. of action. I think the use of two blocks for each wheel is practicable for passenger cars, but is not necessary for freight cars, and the additional apparatus would be too expensive.

We have in this country a great many six-wheeled trucks under passenger cars, and it seems very difficult to get brake shoes on the middle pairs of wheels, which is a misfortune, because the application of the brakes to the middle pair of wheels will make a difference with stopping at 50 miles an hour of about 150 ft. The application of a brake shoe to each wheel of a car is thus a matter of very great importance. A given amount of braking can be done with the application of a good deal less force by distributing it equally over the wheels, and thus there would be a decrease

in the number of flattened wheels from sliding, and a more economical wear of the brake-blocks. The use of continuous brakes on freight trains is beset with great difficulties. We have 600 or 800 railroad corporations at the present time, and it is important that we should have a uniform freight-train brake. If we could get a brake such as the Master Car-Builders asked for a few years ago—that is, one that would not cost more than \$5 per car, and which would be perfectly independent on each car, we would have a very desirable invention; but after 10 years study of the subject, I have not found that we can have the brake you want without a connection from car to car. What is needed is a brake that will apply itself in case it gets out of order, one that will rather stop the train too soon than allow it to go too far; and one that, in the event of the coupling coming apart, will instantly stop both portions of the train. To do that, it is necessary that each car shall have its own apparatus for applying the brake. I am quite sure that if you go into the question thoroughly you will find that the cost that can be borne by railway companies is a great deal higher than you would be willing to admit off-hand. The use of continuous brakes on freight trains would, in my opinion, enable you to run at enough higher speed and do enough more work to be equivalent to an increase of one-fifth of the car equipment. That means an advantage of \$120 a car per year. The accidents on the railroads of to-day on freight trains are something frightful, and I do not see how the railroad companies manage to get men who are willing to work on them. Our company has applied my automatic brake to 75 cars on the Pennsylvania road, running in three separate trains of 25 cars each. They have been running about a year, and I am told are giving good results. We have some brakes applied on the Denver & South Park Railway, where the gradients in places are 212 ft. to the mile. We have experimented with the brakes on 50 cars on the Pennsylvania road and found that there was no difficulty whatever in operating on trains of that length. I think we have solved the problem as to the practicability of a device of this kind on freight trains of any reasonable length.

In addition to the brake I have been speaking of, we have a numerous class of buffer brakes. As I said before, the application of brakes has a tendency to jam the cars together, and if you use powerful engine brakes the force with which the cars are blocked together is sometimes very great. Buffer brakes are intended to be applied by creating a pressure between the cars, and that pressure is brought about by applying brakes to the engine. Thus the brake next to the engine could be compressed with the greatest force and the brakes are applied with a little less force to the second car and so on to the end of the train until there is no appreciable brake force. When we first look at buffer brakes, they seem to have great advantages, but you can never make a buffer brake that will apply itself when a train separates, because such brakes are dependent upon the pressure between the cars, which is taken off by the separation of the train, and for that reason, however good a buffer brake may at first appear, a class of accidents that ought to be prevented are not provided for.

Mr. Westinghouse then said that he would be glad to answer any questions that the gentlemen present might wish to ask.

The President inquired what material makes the best brake-shoe.

Mr. WESTINGHOUSE: Captain Galton and myself experimented with wrought-iron and cast-iron brake-shoes. Wrought iron did not appear to hold very well. It would go on for a considerable time without doing much, but all at once it would seize the wheel and cause it to stop rotating before it made a full revolution. We found pieces of wrought iron weighing nearly an ounce torn out of the shoe. On French railways, where they formerly used wrought-iron blocks, I have seen pieces the width of the brake-shoe and three or four inches long torn either out of the wheel or shoe. The cast-iron shoe showed conclusively during the experiments that with a given amount of force it held a great deal better than the wrought-iron. Not only that, but it held much more uniformly on wet and dry rails. Cast iron always seemed to present an unpolished surface. While experimenting on this subject, I came to the conclusion that the holding power of a brake-block is very nearly in proportion to the amount of material worn off. A wooden block on a dry rail will hold about twice as well as an iron block, but on a wet rail it doesn't hold well. In the Congdon shoe pieces of steel or iron are laid in the mold and the iron is poured around it. It is said to last well, but I do not know whether it holds well. I found a shoe could be made to hold a great deal better by cutting grooves across it.

The President inquired whether it would be advisable to fit freight equipments with the same number of brake shoes that are used on passenger cars.

Mr. WESTINGHOUSE: The brake-gear of freight cars and generally that under tenders, is too shabby for any mechanical use. It is suspended by little rods, the breaking of any one of which will drop the whole apparatus. I am convinced that a large proportion of the unexplained accidents are caused by brake-gear falling under the wheels. A good brake-gear can be put on freight cars at an additional cost not over \$5 to \$10 more than the amount now expended.

Mr. FRY called attention to the fact that 35 per cent. of the brakes on freight cars are suspended from a part of the car that is constantly varying in height.

Mr. WESTINGHOUSE: In dealing with that matter we have had to make the brake-cylinders long enough to provide for an emergency. What should be done with a freight brake, and I think the other benefits would justify it, is to increase the wheel base of the trucks a sufficient amount to admit of the use of substantial brake-beams, and of the suspension of the brake shoes by some apparatus fastened to the lower bolster, which always remains a fixed distance from the rail.

Mr. FRY: Would you be able to brake 75 cars in a train with a well-designed truck?

Mr. WESTINGHOUSE: Yes, but a train of 100 cars would be difficult. I have a valve that can be put in, say, the thirteenth car on a train. This valve allows the air to pass through from the engine to the back of the train to charge the pipes and reservoirs; in such case, brakes on the first 30 cars are used for slowing up. In case of emergency this valve opens and lets air out of the rear of the train, and in that way I think I can brake 150 cars.

Mr. FRY: We now get a braking force on only about 15 cars, but for extraordinary stops we need to get pressure on the balance of the train.

Mr. FORNEY: I agree with Mr. Westinghouse that the present state of the art of brake construction as exhibited in freight cars is a disgrace to railroading, and I have no doubt that if we have such an investigation of the causes of accidents as we ought to have, this defective brake construction would be found to be productive of a large proportion of the casualties on our railroads.

Mr. FRY: I have been led into inquiring as to what was being done all over the country in relation to freight car trucks, and a conclusion has been forced on me that the present freight car truck, not only in its brake arrangements, but in everything else, is very much behind the age, and I found that there was a general feeling among master

car-builders that a change would have to come. Such change has been brought nearer to us in the last six months, by the carrying of heavier loads. The feeling which has been uppermost in my mind, and which has been deepened by the present discussion, is that in designing a new freight car truck, we ought to take into consideration the various demands that are being made upon freight car equipment at the present day, and not to act independently of each other, but to consult together and try to get the truck that will enable us to make our equipment more in accordance with existing demands.

Mr. GOODWIN inquired whether Mr. Westinghouse had made any experiments with short and long wheel-bases to see the difference in friction between the flange and rail on curves.

Mr. WESTINGHOUSE: We have not. I have experimented with an apparatus which would automatically regulate the force against the block in proportion to the work the block was doing. In other words, it was like an ordinary friction brake used in testing an engine. The device worked admirably if used on one carriage, and it was adjusted to a given coefficient of friction. We decided on trying it for 20 per cent. retardation and apply the brakes with a high pressure. As soon as the blocks began to hold a little more than 50 per cent. an escape-valve was automatically opened, thus reducing the pressure in the cylinder to a required degree. In practice on long trains, I did not find it of any great advantage. We had to adjust it for 17 per cent. retardation on account of varying condition of rail, etc., and the result was that in dry weather we could do better work without it. It prevented the sliding of wheels altogether. There is an enormous variation in the coefficient of friction due to the slightest perceptible change of the atmosphere.

The President: The tendency appears to be to increase the tonnage per car. If, therefore, a change is made at all it should be made to the extent possible with the present bridge and rails, and should be made at once. The subject should receive the attention of the best talent in the country.

Mr. WESTINGHOUSE: I think you can get anybody almost to design a standard truck; any draftsman could go around and collect information from the various car-builders, and you could soon arrive at what is needed.

Mr. FORNEY: Just here is where the principal difficulty comes in. The Car-Builders' Association has appointed committees on various subjects year after year, and there is great difficulty in getting anybody to serve on a committee who can devote enough time and ability to making such investigations as should be made. In order that any committee may be able to design a truck suitable to become a standard for the country they ought to get at pretty nearly what has been done in the way of building throughout the country. They then ought to consult with anybody who has views worth knowing. They ought also to be good designers and familiar with all the details of iron and wood construction. Now the difficulty is, we cannot find men of that kind who can or will give the amount of time and ability to the sort of work which we need to have done. I do not think there is any difficulty in having a truck designed. The difficulty occurs in the mechanism of the organization for making a design. We have not the men who can both spare the time and who have the ability for that kind of work.

Mr. JOY: We control the men who do that. A large number of the members of the Association have in their employ mechanical engineers or draftsmen who are specially devoted to designing the work for the road. The trouble is, those men are kept in the background.

Mr. SMITH: A committee to settle on a truck has many obstacles to contend against. One thing they would want to settle would be, which is the best wheel-base; and then there is the brake matter. It is the rule to hang brakes to the top bolster, or else to the body of the car. In my opinion that is all wrong. It costs 25 per cent. more to keep your brakes in repair if you hang them to the body of the car, than if you hang them inside to the bottom bolster.

Mr. WESTINGHOUSE: It is easily demonstrated that it is a decided advantage to have a long wheel base. If you were to make it 10 feet you would find the train would run a great deal easier. The Pennsylvania Railroad has spread the wheel-base of its standard passenger truck 18 inches, and with excellent results.

Mr. FORNEY: Is it a fact that the flanges of wheels are less liable to cut with coned than with straight treads?

Mr. WESTINGHOUSE: I do not know.

Mr. VOGT: In the last two or three years the Pennsylvania Railroad has made a change in the shape of the tires of locomotives. They used to have a cone of about $\frac{1}{8}$ in. in 3 in., or rather a difference in diameter of about $\frac{1}{8}$ in. in the 3 in. That was changed for an experimental purpose. The portion of the tread nearest the flange was made perfectly straight and then coned off from their outside so as to save the hollowing out of tire to some extent. That is to say in a given length of run the tire would not be worn out quite so hollow, and it does not seem to make any difference at all in the wear of the flange. The flange did not seem to be at all more exposed to wear than when the wheels were coned.

Mr. FORNEY: Was that tried on the truck wheels?

Mr. VOGT: No sir, but I have seen from German journals that in some instances it has been the practice there to do exactly the same thing on car wheels.

Mr. FRY proposed a vote of thanks to Mr. Westinghouse for his interesting address, and hoped that what he said would have the effect of waking us up and causing us to look into the future to prepare for the inevitable, which is the running of freight trains at a higher rate of speed, and thus reducing the amount of equipment for doing a given amount of work.

The vote of thanks was unanimously adopted.

The meeting then adjourned.

Since the above meeting we have information that the Central Pacific, the Southern Pacific and their various branches have ordered automatic brakes for their entire freight equipment and that the Union Pacific has also ordered automatic freight brakes for the Denver & South Park Division equipment.

New England Railroad Club.

About 50 gentlemen connected with railroads assembled at the Quincy House, Boston, Wednesday evening, March 21, in response to a call signed by F. D. Adams, George Richards and J. W. Marden, who were the committee appointed at an informal meeting at Mason Building, Feb. 22, for the purpose of organizing an association similar to the Car-Builders' Club in New York.

The following gentlemen were present:
F. D. Adams, Master Car-Builder Boston & Albany.
J. W. Marden, Master Car-Builder Fitchburg R. R.
Amos Pillsbury, Supt. Rolling Stock Eastern R. R.
J. T. Gordon, Master Mechanic Boston & Lowell.
J. D. Bilings, Master Car-Builder Eastern R. R.
H. E. Barker, General Foreman New York & New England.
F. A. Perry, Master Mechanic Casshire R. R.
J. B. Fletcher, Superintendent National Car Co.
George F. Fisher, Purchasing Agent Boston & Maine.

George Richards, Master Mechanic Boston & Providence
E. Lang, Boston & Providence.
C. H. Bannister, Boston & Providence.
George Barnes, Boston & Providence.
E. A. Walker, Master Mechanic Maine Central.
George A. Ferguson, Assistant Master Mechanic Boston,
Concord & Montreal.
D. C. Richardson, Master Car-Builders Boston & Maine.
W. A. Foster, Master Mechanic V. & M. Div., Fitchburg
R. R.
T. Cooley, Boston, Revere Beach & Lynn.
John Coghlan, Master Car-Builders Boston, Revere Beach &
Lynn.
Grafton Upton, Fitchburg, R. R.
A. H. Marden, General Foreman, Fitchburg R. R.
J. M. Ford, Boston & Albany.

stated that the object was to form a railroad club for the purpose of discussing questions pertaining to railroad business. It was proposed to embrace all who were connected with railroad matters, either in actual service, or furnishing supplies for railroad use, in its membership. A constitution was submitted and each article voted on. The name is to be the New England Railroad Club. The officers elected were F. D. Adams, President; J. W. Marden, Vice-President; George E. Pratt, Secretary and Treasurer. J. W. Marden, A. Pillsbury and F. D. Adams was constituted an executive committee. Forty-four names were signed to the roll of members. It was voted that the meetings be held on the evening of the second Wednesday of each month at 7 o'clock. The Secretary was requested to communicate with the President of the New York Club, and extend to its members a cordial welcome to meet the members of the Boston club as often as possible.

bushing into the sleeve. Upon its outer periphery is formed a flattened screw-thread *g*, fig. 1, of triangular section, with one side perpendicular to the sleeve, and the other at an acute angle therewith, to admit of wedging action being exerted and also easy release effected between said thread and that formed in the bushing *C*, or in the solid frame if it be preferred to dispense with the bushing.

A circular nut *E*, having a handle *H*, is fitted to the thread upon the flexible clamping sleeve *B*, and is held from moving laterally by an opening in the frame of tail-stock *A*, into which it is accurately fitted.

It is now obvious that upon rotating the nut *E* by means

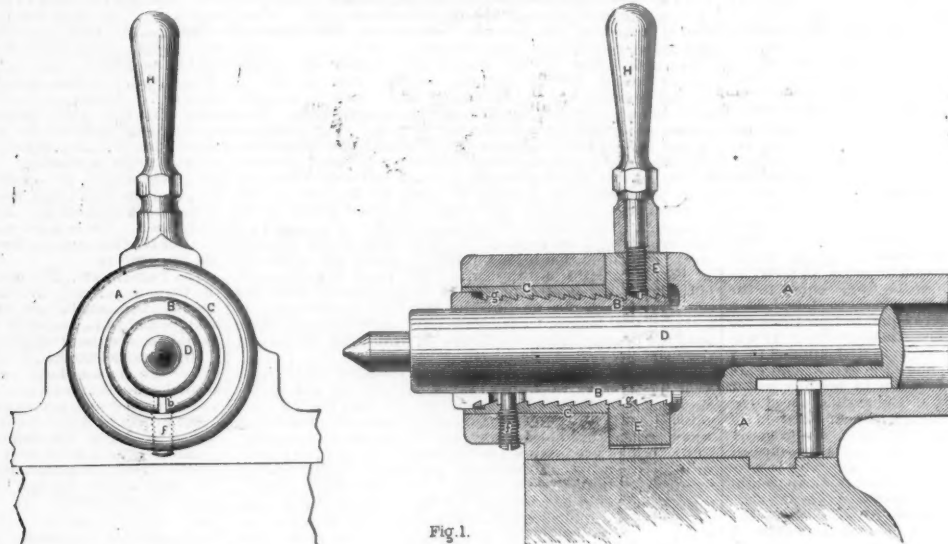


Fig. 1.

FAUGHT'S IMPROVED HOLD-FAST FOR LATHE SPINDLES.

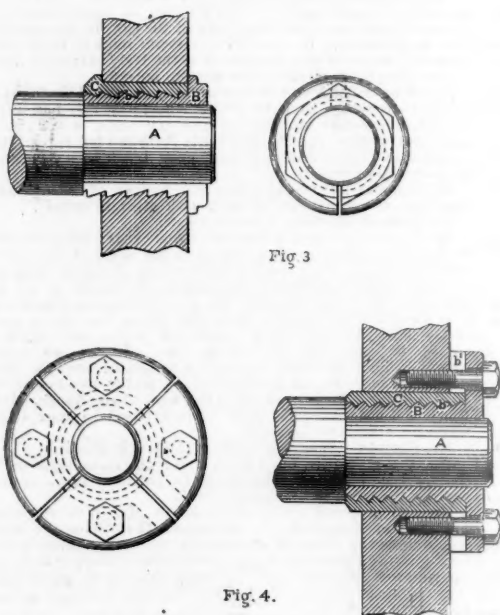


Fig. 3

Fig. 4.

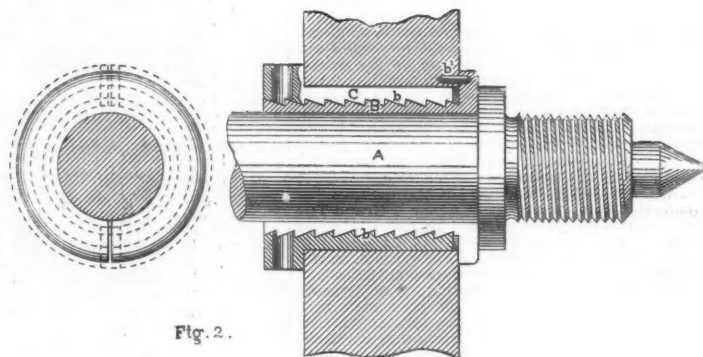


Fig. 2.

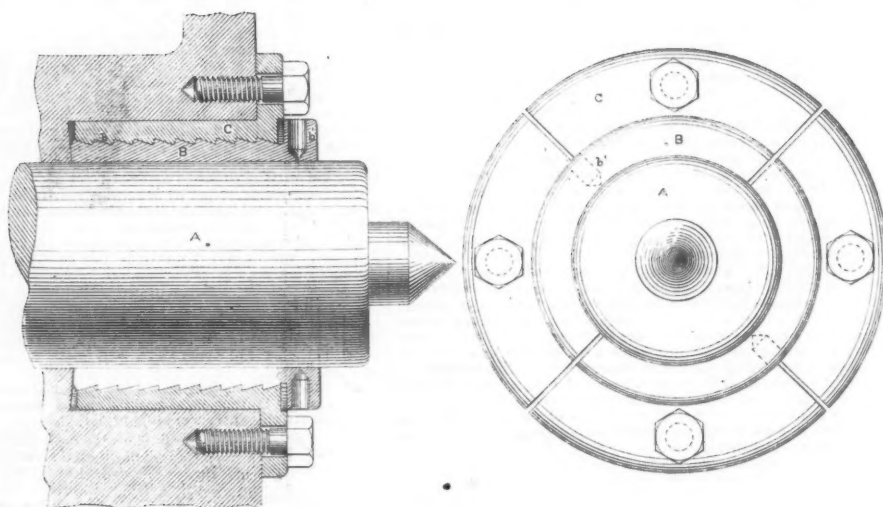


Fig. 5.

D. M. Brady, New York Central & Hudson River.
James T. Leighton, New Haven, Conn.
H. G. Thomas, R. Sherburn & Co., railroad supplies, Boston.
H. A. Banning, New York.
Sam'l D. Nye, Washburn Iron Co., Worcester, Mass.
N. Washburn, Allston Car Wheel Co., Allston, Mass.
C. J. Post, Tillotson & Co., New York.
W. W. Snow, Ramapo Wheel & Foundry Co.
J. T. Ross, railway supplies, Boston, Mass.
G. W. Peck, Wm. Page & Co., Boston, Mass.
C. D. W. Gibson, President Cliff & Righter Co., N. Y.
Curren Dinsmore, U. S. Concave Spring Co., N. Y.
H. Leach, railway supplies, Boston, Mass.
G. W. Goddard, Suspension Car Truck Co.
A. F. Cooper, Boston Standard Wheel Co., Cambridgeport, Mass.
I. N. Keith, West Sandwich, Mass.
Osgood Bradley, Worcester, Mass.
J. N. Krepps, New York.
N. F. Ryder, Burbank, Ryder & Damon, Boston.
J. F. Hudson, Boston, Mass.
H. B. Crane, Fitchburg Railroad.
R. Littlefield, Fitchburg Railroad.
J. Hubbard, Fitchburg Railroad.
W. A. Gillespie, Fitchburg Railroad.
The meeting was called to order by Mr. F. D. Adams. He

Faught's Improved "Hold-Fast" for Lathe Spindles.

L. R. Faught, Superintendent of A. Whitney & Son's car wheel works in Philadelphia, has recently brought out a new device, illustrated in the adjoining cuts, for clamping spindles, and especially those of lathe tail-stocks, which, it is expected, will supersede his previous invention for the same purpose known as the "conical binder," and applied for some years past to the tail-stocks of the best Philadelphia built lathes.

Fig. 1 shows a vertical section through the tail-stock of a lathe with the spindle and "hold-fast" in position.

The frame *A* of the tail-stock is counterbored to receive the bushing *C*, which may be a forced fit, or pinned or screwed firmly to its place, and has cut upon its interior a screw-thread of peculiar section fitted to receive the flexible clamping sleeve *B*. This sleeve is bored out centrally to fit easily upon the spindle or shaft *D*, which is to be locked or released by it at will.

The sleeve is split, or divided longitudinally, by a slot *b*, so as to admit of lateral flexibility. It is prevented from rotating by a pin, or stud *f*, passing through the frame and

of its handle *H*, the flexible sleeve *B*, being itself held from rotation by the pin *f*, must move endwise, impelled by the action of the laterally fixed nut upon its thread. If the sleeve be drawn inward, therefore, the inclined plane of the continuous screw-thread will wedge against the corresponding thread in the bushing or frame, and as the sleeve is divided longitudinally upon the under side so that it is free to collapse, the consequence will be that the sleeve will be forced or compressed inward concentrically upon the spindle, thus locking it truly central and with a force due to the angle of the wedge thread and the length of the handle. This action, it is to be observed, takes place equally throughout the whole length of the sleeve, a manifest advantage.

By reversing the motion of the nut, the sleeve is moved in the reverse direction, releasing the wedging action of the screw and with it the spindle. There are holes at different points upon the nut *E*, into any of which the handle *H* may be shifted when necessary for taking up wear.

In fig. 2 the flexible shaft *B* is itself secured to the frame by the pin *b*, while the bushing *C*, which is made a snug

running fit in the frame, can be revolved less or more as required by means of holes in its flange; the effect being the same as in fig. 1, to compress the flexible sleeve B, and force it, throughout its whole length, concentrically inward upon the shaft.

Fig. 3 shows the flexible sleeve B operated by means of a hexagon formed upon its outer flange, to which a wrench could be conveniently applied. It can be fitted as usual, either to a bushing C keyed to the frame as shown in upper half, or to a thread formed in the frame as seen in lower half (below the centre line).

In fig. 4 the sleeve B is made with a broad flange operated by bolts. Between the flange and the frame an elastic packing b is placed, which being compressed by screwing up the bolts, allows the sleeve to wedge against the thread in the bushing or frame and thus tighten itself concentrically upon the shaft as desired. In all these cases and others wherever this adjustable bushing can be employed to advantage the action is identical, to tighten the flexible sleeve B truly and concentrically throughout its entire length as much or little as may be necessary and thus take up the wear and keep a perfect bearing upon the journal without the use of caps and boxes.

National Association of General Passenger and Ticket Agents.

We give below the official report of the meeting held in New York, March 14, which was called as a special meeting to take the place of the annual meeting, which was to have been held in Jacksonville, Fla., the change being made at the request of a number of members:

The President, E. P. Wilson, called the Convention to order at 11 a. m. on Tuesday, March 13, at the National Railway Club Rooms in New York.

A call of the roll developed the fact that a quorum was present.

The Executive Committee took favorable action on all credentials presented to them, and reported to that effect through the Chairman, Mr. Cummings.

The following is the present list of members. Those marked with a * were in attendance; those marked with a + have become members since last Convention:

*Abbott, John N., New York, Lake Erie & Western.
 *Allaire, J. H., People's Line Steamers.
 *Anderson, J. C., New York, Ontario & Western.
 *Allen, D. C., South Carolina.
 Ames, W. O., Florida Central & Western.
 Anthony, W. M., Boston, Barre & Gardner.
 Archer, John J., Scioto Valley.
 *Atmore, C. P., Louisville & Nashville.
 *Affleck, E. T., Cleveland, Akron & Columbus.
 *Baldwin, H. P., Central, of New Jersey.
 *Baldwin, Wm. S., Buffalo, New York & Philadelphia.
 Barker, James, Wisconsin Central.
 Barry, Thomas P., Cincinnati, Washington & Baltimore.
 Bennett, P. J., Little Rock & Fort Smith.
 *Bennett, W. H., Toledo, Ann Arbor & Grand Trunk.
 Best, J. H., Keokuk & St. Louis Line.
 Bodine, John F., Williamstown Railroad.
 Boothby, F. E., Maine Central.
 Boylston, S. C., Charleston & Savannah.
 *Bronson, H. M., Indiana, Bloomington & Western.
 Brown, J. W., Bay Line Steamers.
 Buchanan, J. R., Sioux City & Pacific.
 Butterfield, Theo., Utica & Black River.
 Brown, Chas. L., Kentucky Central.
 Busby, A. S., Intercolonial.
 *Brown, A., Junction & Breakwater.
 *Byington, E. B., Lehigh Valley.
 Campbell, Geo. B., Fort Wayne, Cincinnati & Louisville.
 *Carpenter, A. V. H., Chicago, Milwaukee & St. Paul.
 Carpenter, T. P., Lake Superior Transit Co.
 Carpenter, W. A., Detroit, Lansing & Northern.
 *Clark, A. E., New York, Pennsylvania & Ohio.
 Cary, J. W., Lake Shore & Michigan Southern.
 Chandler, F., Missouri Pacific.
 Charlton, James, Chicago & Alton.
 *Collbran, H., Alabama Great Southern.
 Cole, L. M., Baltimore & Ohio.
 *Cummings, S. W., Central Vermont.
 *Connor, Geo. L., Old Colony Steamboat Co.
 Davis, H. C., St. Paul, Minneapolis & Manitoba.
 *Danley, W. L., Nashville, Chattanooga & St. Louis.
 Deal, T. M., Mississippi.
 Davant, T. S., Memphis & Charleston.
 Drane, Frank C., Iron Steamboat Co.
 Dawes, A. C., Kansas City, St. Joseph & Council Bluffs.
 Dering, H. R., Jeffersonville, Madison & Indianapolis.
 Dorsey, E. R., Georgia Railroad.
 *Durfee, W. M., Providence & Worcester.
 Elliott, J. M., Jr., Gadsden & Red Line steamers.
 *Egan, John, Cincinnati, Indianapolis, St. Louis & Chicago.
 Emmerson, T. M., Atlantic Coast Line.
 Eustis, P. S., Burlington & Missouri River (in Nebraska).
 Fenwick, Chas. B., De Bary Merchants' Line.
 *Emery, I. S., Rochester & Pittsburgh.
 Ettinger, M. L., Chicago & Iowa.
 Filkins, L. W., Stonington Steamship Line.
 Flanders, D. J., Boston & Maine.
 Fenne, John A., Boston, Revere Beach & Lynn.
 Ford, E. A., Pennsylvania Co. and Pittsburgh, Cincinnati & St. Louis.
 *Foye, Chas. H., Portland & Ogdensburg.
 *Fuller, H. W., Chesapeake & Ohio.
 Gabbett, Cecil, Western, of Alabama.
 Gallup, E., Boston & Albany.
 *Gilson, H. N., Tuckerton Railroad.
 *Hooper, S. K., Hannibal & St. Joseph.
 *Hancock, C. G., Philadelphia & Reading.
 Hanson, A. H., Illinois Central.
 Harrison, F. E., New Haven & Derby.
 Harrison, W. H., Columbus, Hocking Valley & Toledo.
 *Hill, Wm., Chicago & Eastern Illinois.
 *Holwill, W. F., Delaware, Lackawanna & Western.
 Houston, W. J., Northeastern, of Georgia.
 Hardy, L., Vicksburg & Meridian.
 *Hall, James M., Wheeling & Lake Erie.
 Haas, Sol, Associated Railways of Virginia and the Carolinas.
 *Jaques, E. A., Lebanon Springs.
 Johnson, A. H., Arkansas Midland.
 Johnson, W. P., Lake Shore & Michigan Southern.
 Kingsbury, F. H., Cheshire.
 *Kendall, A. C., New York & New England.
 Kendrick, D. M., Delaware & Hudson Canal Co.
 *Keller, Murray, Louisville, New Albany & Chicago.
 *Lambert, C. E., Troy & Boston.
 *Leach, H. N., Burlington & Lamollee.
 Leet, A. B., Grand Rapids & Indiana.

*Littlefield, James, Boston & Bangor Steamship Co.
 *Lord, C. K., Baltimore & Ohio.
 *Lowell, Percival, Chicago, Burlington & Quincy.
 *Liscomb, J. F., Portland Steam Packet Co.
 *MacDonell, A. O., Florida Transit Co.
 *McCollister, A., Cincinnati, Selma & Mobile.
 *Milligan, F., Detroit, Mackinac & Marquette.
 *Mills, B. F., Burlington, Cedar Rapids & Northern.
 *Moran, M. R., New London Northern.
 *Morse, J. W., Union Pacific.
 *Morse, J. W., Montpelier & Wells River.
 *Monett, H., New York, West Shore & Buffalo.
 *Merkil, R. D., Jr., Quebec Central.
 *Macmurdo, J. R., Western North Carolina.
 *Nims, F. C., Denver & Rio Grande.
 *Nimmo, C. A., Troy & Boston.
 *Nonnemacher, A. W., Lehigh Valley.
 *Orme, A. J., Atlantic & West Point.
 *Pierce, T. W., Jr., Galveston, Harrisburg & San Antonio.
 *Pope, A., Shenandoah Valley, Norfolk & Western and East Tennessee, Virginia & Georgia.
 *Palmer, J. H., Massachusetts Central.
 *Pearce, Walter, Hartford & Connecticut Western.
 *Fomeroy, F. L., Ogdensburg & Lake Champlain.
 *Popple, F. W., Providence & Stonington Line.
 *Riv, E. A., New Haven & Northampton.
 *Rice, Owen, Cincinnati, Wabash & Michigan.
 *Ruggles, O. W., Michigan Central.
 *Roberts, D. C., Memphis & Little Rock.
 *Sanderson, Geo. A., Texas Mexican.
 *St. John, E., Chicago, Rock Island & Pacific.
 *Simmons, W. F., Northern (N. H.).
 *Sarat, M. W., Utica, Ithaca & Elmira.
 *Slaughter, Mercer, Richmond & Danville lines.
 *Shattuc, W. B., Ohio & Mississippi.
 *Stinson, I. D., Shenandoah & Allegheny.
 *Smith, A. D., Pittsburgh & Lake Erie.
 *Stebbins, C. S., Union Pacific.
 *Smith, A. J., Cleveland, Columbus, Cincinnati & Indianapolis.

*Spafford, H. W., Bennington & Rutland.
 *Sprague, J. Jr., Old Colony.
 *Smith, Geo. W., Lake Erie & Western.
 *Stevens, C. H., St. Johnsbury & Lake Champlain.
 *Stennett, W. H., Chicago & North Western.
 *Stevenson, Samuel, Cincinnati, Hamilton & Dayton.
 *Stephenson, J., Grand Trunk.
 *Taylor, C. A., Richmond, Fredericksburg & Potomac.
 *Taylor, Jas. L., Savannah, Florida & Western.
 *Teasdale, T. W., Chicago, St. Paul, Minn. & Omaha.
 *Thrall, W. A., Chicago & North Western.
 *Tompkins, H. V., St. Johns River Steamers.
 *Townsend, H. C., Wabash, St. Louis & Pacific.
 *Tuttle, L., Eastern.
 *Utley, E. E., Allegheny Valley.
 *Van Benthuyzen, C. R., Hudson River Line Steamers.
 *Waldo, J., Houston & Texas Central.
 *Waller, Chas. J., Mobile & Ohio.
 *Watson, J. R., Fitchburg.
 *White, W. F., Atchison, Topeka & Santa Fe.
 *White, A., Midland, of Canada.
 *Whitehead, G. A., Central, of Georgia.
 *Wildor, J., Boston, Hoosac Tunnel & Western.
 *Williams, D. E., Mobile & Girard.
 *Wilson, E. P., Cincinnati Southern.
 *Wishart, D., St. Louis & San Francisco.
 *Wood, J. R., Pennsylvania Railroad.
 *Wrenn, B. W., Western & Atlantic.
 *Zimmerman, D. M., Camden & Atlantic.
 The following honorary members were present:
 F. R. Myers, Chicago, Ill.; H. W. Gwinner, New York, and S. F. Pierson, Denver, Col.

Total number of members, 152; number present, 68.
 Special credentials for this meeting were presented as follows:

By R. D. Carpenter, representing Associated Railways of Virginia and the Carolinas; by J. W. Burdick, representing Delaware & Hudson Canal Co.; by Jonah H. White, representing Savannah, Florida & Western; by J. M. Chesbrough, representing Vandalia Line; by C. W. Adams, representing Pennsylvania Co.; by C. C. Cobb, representing Pittsburgh, Cincinnati & St. Louis; by D. Cardwell, representing Charlotte, Columbia & Augusta; by Geo. W. Boyd, representing Pennsylvania Railroad.

The chair announced that a motion was necessary in order to substitute this for the regular meeting.

By Mr. Tuttle, seconded by Mr. A. E. Clark:
 "Resolved, That this special meeting be substituted for the annual meeting of the Association, and so stand on the records."

Adopted.
 The Chair announced that the next order of business was the making of passenger rates; on motion, this was dispensed with.

The selection of the next place of meeting being next in order, the following points were placed in nomination: Chicago, Cincinnati, New York. The result of the roll call was as follows: Chicago 34, Cincinnati 6, New York 13, and the Chair announced Chicago to be the next place of meeting.

Unfinished business being next in order, the report of the committee of 15 on coupon tickets was called for.

The chairman of such committee stated that he had been unable by correspondence or otherwise to secure the definite views of a majority of the members of such committee.

On motion, duly seconded, the report was received and the committee discharged.

The Chair then called for the report of the General Committee, which was presented as follows:

"First—Transportation of theatrical parties in private cars. After due consideration of this matter, we are unanimous that not less than 18 full unlimited tickets should be accepted from any theatrical company traveling in their own private car, and when more than that number shall travel in such car, regular theatrical rates shall be charged, provided always that the amount received from such theatrical company shall not be less than 18 unlimited fares.

"Second—Communication from Secretary of General Baggage Agents' Association.—After due consideration, we would recommend the adoption of the suggestion contained in the communication from M. B. Starring, Secretary of the General Baggage Agents' Association, viz., that the cost of joint baggage checks be prorated by the various roads in interest, said cost to be based upon the longest available mileage over which such checks can be used."

On motion, duly seconded, the above report was adopted. On motion, adjourned until 11 a. m., Wednesday, March 14.

SECOND DAY.

Convention called to order at 11 a. m., the President, E. P. Wilson, in the chair.

Mr. S. W. Cummings asked for a suspension of the rules to permit General Norton to address the Association in reference to the exhibition of foreign products at Boston, which was granted, and Gen. Norton addressed the Association at some length as to the aims and objects of the exhibition, and as to the advantages that would probably be derived

by the various roads in interest by extending special rates to those desiring to attend.

Regular order of business resumed.

By Mr. Stevenson, seconded by Mr. Egan:

"Be it resolved, That it is impracticable to check single pieces of baggage in excess of 250 pounds weight, and that after May 1, 1883, no single piece of baggage in excess of 250 pounds weight will be checked, and that the general baggage agents of the respective lines be instructed to enforce this resolution."

Adopted unanimously.

On motion of Mr. C. R. Van Benthuyzen, a committee of five was appointed to draft resolutions of respect to the memory of the late John C. Hewitt, of the People's Line, whose death occurred since last meeting:

The chair appointed Messrs. Van Benthuyzen, Connor, Cummings, Burdick and Boyd as such committee.

After a short recess, the committee reported as follows:

"It is with sincere regret this Association records its sorrow upon the death of Mr. John C. Hewitt, late General Ticket Agent of the People's Line Steamers. His long service of nearly two-score years with that line, his steadfast attention to its interests, his ever courteous disposition to those associated in business with him, are characteristics worthy of emulation, and impress us with lasting thoughts of his memory."

"Resolved, That this resolution be placed in the minutes of our Association, published in the *Official Guide*, and that a copy be sent to his family."

Adopted unanimously.

The following communications from F. Chandler, General Passenger Agent of the Missouri Pacific Railroad, were read by the Secretary, dated March 9:

"As I am not expecting to be present at the annual meeting, 13th inst., I give you copy of telegram received yesterday in reference to tickets for Knights Templar attending the convocation at San Francisco, in August next, dated San Francisco, Cal., March 8.

"We have decided it better to issue our own line tickets only for Knights Templar from Council Bluffs, Kansas City, St. Louis, Memphis, New Orleans, and intermediate points to San Francisco and return."

"Eastern roads can issue exchange orders on above offices, but most of the commanderies can be furnished tickets in advance or prior to leaving their starting points, through your agents or by express C. O. D. We will notify Eastern roads by joint circular that they must not issue through tickets beyond Missouri or Mississippi River points. This will avoid the necessity of giving any particular form to Eastern roads, as the question will be controlled by Stebbins, White and yourself."

[Signed] "T. H. GOODMAN."

"Messrs. White and Stebbins are now in San Francisco, and the above telegram was sent after conference with them."

"I find that in my circular of Feb. 1, as chairman of Committee of the Association, I made the mistake of stating that for the members of the Grand Commandery only the rate going and returning by the same route will be \$50. This should be for members of the Grand Encampment only. I was not aware, or overlooked the fact, that the grand body of the United States, for which a special rate of \$50 was made, is known as the Grand Encampment."

"The mistake occurs in the fourth line of second clause of the circular."

"Please notify the Association of the information contained in above telegram, and the mistake made and its correction in my circular, a copy of which, corrected, is inclosed."

A further communication from Mr. Chandler, dated March 10, was read as follows:

"I am in receipt of further information in regard to Knights Templar tickets to that given you yesterday."

"Tickets go on sale June 1, good west-bound until Aug. 18, and returning until Oct. 31, but not good to leave San Francisco before Aug. 26. Stop-overs allowed either way."

On motion by Mr. Abbott, duly seconded, the Secretary was instructed to incorporate the report of Mr. Chandler's committee in the regular proceedings of this Association as a matter of information. Adopted. They are given herewith:

"St. Louis, Feb. 1, 1883.

"At a meeting of the committee of 15 appointed at the semi-annual meeting of the National Association of General Passenger & Ticket Agents, at Montreal, Sept. 20, 1882, to fix rates from Chicago, St. Louis, Peoria, and Mississippi River common points, to San Francisco and return, for the Triennial Conclave of Knights Templar in August, 1883, and from the same points to Denver for the National Encampment of the Grand Army of the Republic, in July, 1883, held at Chicago, Oct. 31, 1882, it was resolved that the rate to all Knights Templar en route to the Conclave, regardless of rank, from all points east of the Missouri River to Council Bluffs, St. Joseph, Atchison, Leavenworth or Kansas City and return, shall be one fare for the round trip, and the same rate shall apply for the Grand Army Encampment. Action was subsequently taken upon the question of chartering cars to Commanderies and Grand Army posts, to the effect that this shall not be done, but that the rate of one full fare for the round trip to Missouri River points shall be required of each and every person attending either gathering."

It has further been decided by the lines from the Missouri River to the Pacific coast that the rate from their eastern terminal points, by all routes, to San Francisco and return, for Knights Templar holding certificates of membership under the seal of the order, and their female relatives only, shall be \$75 going and returning by the same route, and \$100 going one route and returning by another. For the members of the Grand Encampment only, the rate going and returning by the same route will be \$50, but for their female relatives accompanying them the rate will be \$75; going and returning by different routes, \$25 additional will be charged this body, as all other Sir Knights."

The following will be the rates for the principal points, going and returning by the same route: From St. Paul for the round trip, \$88.75; Milwaukee, \$91.50; Chicago, \$89.80; Peoria, \$85.85; Rock Island, \$85.05; Burlington, \$84.05; Quincy, \$81.90; Hannibal, \$81.15; St. Louis, \$83; Cairo (via El Paso), \$83; Columbus, Ky. (via El Paso), \$83; Memphis (via El Paso), \$80; New Orleans (via El Paso), \$80.

The date of commencing sales, the limit for return passage, and the form of tickets required from Missouri River points and the Eastern terminals of the Texas Pacific line, are yet to be decided, and will be given by the lines interested as soon as determined on. But, in order to distribute the business over as long a period as is practicable, and thereby facilitate its prompt and successful transaction, sales will probably begin as early as June, and continue to a date that will give ample time to arrive by the opening of the Conclave, with a return limit enabling a tour of the coast after it is over.

"Private cars with sleeping accommodations will be taken, subject to the rules of the overland lines as to the number of tickets required from parties in special cars."

"For the Grand Encampment G. A. R., the rate of \$25 round trip from Missouri River points to Denver and return, going and returning by the same or different lines will be

made for members of the Grand Army of the Republic, upon certificates of membership only. Full particulars as to dates of sale, conditions, limit and form of tickets will be given by joint circular of the Colorado lines or their commissioner.

A part of the information contained in this circular has but recently been furnished me, the want of it causing the delay in making this report. The undersigned will take pleasure in promptly answering further inquiries on this subject, as far as he is able.

(The above report has been corrected as indicated in Mr. Chandler's letter of March 9.)

By Mr. Keller, seconded by Mr. Atmore:
"Whereas, The Southern Cotton Exposition will be held at Louisville, Ky., commencing Aug. 1 next, and continuing 100 days, be it

"Resolved, That as a body we recommend that all lines represented in and by this Association make a uniform rate of one and one-third regular limited fare for the round trip, over lines by which tickets read, to parties desiring to attend, and that tickets sold at such rates shall be 'iron-clad,' and good only for return passage 30 days from date of sale; provided that in no case shall tickets be made good for return trip after Nov. 25, 1883."

Adopted.
A communication from Richard Garvey, of the Garvey bicycle agency of St. Louis, was referred to the General Committee, who reported as follows:

"We have considered the subject of free transportation of bicycles, as set forth in letter of March 5, 1883, addressed to J. M. Chesbrough by Richard Garvey, of the Garvey bicycle agency at St. Louis, and would recommend that no present action be taken in connection therewith."

On motion, the report of the committee was adopted.

By Mr. Atmore, seconded by Mr. G. W. Smith:

"Be it Resolved, That it is the sense of this Association that the practice of some members thereof, who sell through coupon tickets from points where the rate is less than at points through which ticket passes to its destination, is detrimental to the interest of rail lines, and should be stopped."

The President here called the Vice-President to the chair.

By Mr. Wilson, duly seconded:

"I move that the resolution be laid on the table."

The Chair allowed discussion on the motion to lay on the table, which was participated in by Messrs. Atmore, Wilson and others, after which it was adopted.

The following was then offered and seconded:

"Resolved, That when charges for excess baggage are collected by any company to a point beyond its own line, that the initial company making such collection shall render monthly a report of such collection or collections to each company interested similar to the regular monthly report of through ticket sales, and remit to each company its proportion of moneys so collected."

The consideration of this resolution brought forth remarks from several members. Mr. George W. Boyd, speaking for the Pennsylvania Railroad, desired to be put on record as in favor of reporting excess baggage collections when some system could be devised by which they would have the same check on extra baggage forwarded over their lines that they now have on passengers who are ticketed over their lines, but until such a system is devised they will continue to retain what they collect and allow other lines to do the same.

The resolution was adopted.

The following was offered and seconded:

"Resolved, That corpses of persons who have died of small-pox, scarlet fever, typhoid fever, diphtheria or other contagious or infectious disease, shall not be received, unless in hermetically sealed cases. Corpses included in other than hermetically sealed cases shall be received for transportation only when accompanied by a certificate signed by the town or city clerk or registrar, or by a well-known and respectable medical officer, stating that the death did not result from a contagious or infectious disease. This certificate must also distinctly state the name of the disease, or nature of the casualty, that occasioned death, and must be securely fastened to the top of the case. Corpses are to be taken only when in the care of an accompanying adult person, and must be prepaid by a first-class unlimited ticket, and shall not be ticketed beyond the termini of the initial line."

An extended discussion followed, which was participated in by Messrs. Stennett, Boyd, Pope, Atmore and Tuttle, and on question being put was carried unanimously.

A communication from Mr. H. C. Townsend in relation to rates to the anniversary celebration of the Knights Templar was read, and on motion was referred to the General Committee.

The General Committee reported as follows:

"We have considered the matter of rates for Knights Templar to San Francisco from points east of St. Louis and west of the western termini of the trunk lines, as set forth in communication from Mr. Townsend under date of March 1, 1883, and would recommend that the matter be referred to a special committee of five, such committee to report by circular to the members of this Association at as early a date as practicable."

On motion, the report was adopted, and the chair appointed the following gentlemen to serve on such committee:

Messrs. Townsend, Ford, Bronson, Stevenson and A. J. Smith.

Election of officers was next in order, and the following were unanimously elected: President, Lucius Tuttle; Vice-President, C. A. Taylor; Secretary, A. J. Smith.

To fill vacancies in the executive and general committees the Chair made the following appointments, no objection being offered:

Executive Committee—B. W. Wrenn, J. L. Taylor, C. P. Atmore and E. T. Affleck.

General Committee—H. R. Dering, E. St. John, John Eagan and T. M. Emmerson.

The Chair next addressed the Association as follows:

"GENTLEMEN: I desire to present Mr. Tuttle, our President-elect, and in so doing wish to thank you for the courtesy and forbearance with which you have dealt with your humble servant. I feel confident that under the administration of Mr. Tuttle the Association will go forward and prosper, and meet with abundant success."

Mr. Tuttle then addressed the Association as follows:

"GENTLEMEN: I thank you for all the courtesies and honors extended. If I shall be able to conduct the duties of the office in as satisfactory a manner as they have been for the past year, I shall meet with your approval."

The following was next offered, seconded, and carried unanimously.

"Resolved, That the thanks of this Association are due, and are hereby tendered to Mr. H. W. Gwinner, President of the National Railway Publication Co., for the very excellent accommodations and facilities furnished for the transaction of business, and also for the many courtesies extended to the members during attendance."

On motion, adjourned sine die.

Baltimore & Ohio Employes' Relief Association.

We give herewith the greater part of the second annual report of the Secretary and Managing Committee of the

Baltimore & Ohio Employes' Relief Association, which is by far the largest and most important association of the kind in this country, and which is actively aided and promoted by the company and its officers. The report is signed by W. I. Barnard, Secretary, and approved by W. M. Clements, Chairman of the Committee of Management.

The fiscal year of the Association having, by constitutional amendment, been changed to coincide with that of the Baltimore & Ohio Co., which ends Sept. 30, so as to facilitate accounting between the company and the Association, the statement of receipts from members and of payments to them, and of the future liabilities of the Association to them, required by article VII, and which would otherwise have been rendered as of Dec. 31, 1881, being now due for the 21 months intervening between Jan. 1, 1881, and Sept. 30, 1882, is herewith submitted; as also a report of the operations of the Association for the period not covered by previous report.

Receipts.

The balance stated in the report covering the operations of the Association during 1880, as on hand Dec. 31, 1880, was....

\$47,040.12

Receipts during that period from all sources were:

Premiums from members.....\$332,038.30

Interest:

18 months' interest upon B. & O. Co.'s donation of \$100,000.....9,000.00

Interest earned from temporary investment of funds not needed for immediate use.....4,050.00

\$345,088.30

Total.....\$392,128.42

Disbursements.

To members, in payment of accidental and sick benefits, and for death losses.....\$281,717.28

To physicians and hospitals, for surgical attendance upon members in accidental disabilities; in payments for vaccine virus, medicine, etc., distributed among members to prevent or check diseases; for printing annual and monthly reports, etc.....20,000.41

Aggregate disbursements.....302,617.69

Cash on hand.....\$89,510.73

To which should be added five months' interest on B. & O. Co.'s contribution uncollected Sept. 30, 1882.....2,500.00

\$92,010.73

Sept. 30, 1882, balance.....\$40,473.60

From this sum must be set aside amount necessary to meet outstanding liabilities, i. e., moneys due but yet unpaid on account of deaths occurring, and allowances to members and physicians and hospitals, on account of injuries received or sickness contracted, prior to Sept. 30, 1882, viz.....21,424.46

\$1,808.06

Net balance.....\$30,112.67

Analysis shows this net balance to have been derived from the following sources:

Surplus transferred from 1880 to 1881 account (being unexpended balance remaining after liquidating all liabilities on 1880 account, including an additional 100 per cent. natural death benefits to 1881 members).....\$5,522.56

Surplus of premiums received from members over total disbursements.....11,390.11

Interest on B. & O. Co.'s contribution, credited to 1881-1882 account.....8,000.00

To which add interest from same source for five months ending Sept. 30, 1882, yet uncollected.....2,500.00

Earnings from temporary investment of funds not needed for immediate use.....2,700.00

\$30,112.67

This surplus, \$30,112.67, represents the net balance resulting from the operations of the Association to Sept. 30, 1882, inclusive, and under the terms of our constitution is to be used "to reduce the next year's contribution or to increase the allowance for natural deaths, or" is to "be otherwise devoted to promoting the interests of the Association in such manner and at such times as shall be deemed best by the Committee of Management."

The reasons which induced your committee to distribute the balance, \$18,550.79, resulting from the first year's operations of the Association, to those members whose contributions to the fund made it, in the form of an increased natural death insurance, were fully explained in the annual report submitted May 1, 1881. Those employes registering as members in 1881 were, equally with their seniors in the Association, entitled to participate in the profits their premiums helped earn. Notwithstanding the largely increased membership obtained in 1881 greatly augmented the receipts from premiums, without entailing any expenditure for collection, and though the most diligent efforts were made to protect your funds against fraudulent claims, the losses of that year were so great as to excite an apprehension that the additional natural death insurance would have to be reduced if not wisely discontinued the succeeding year. But the general approbation accorded the announcement that the surplus of 1880 would be devoted to increasing natural death benefits so thoroughly confirmed the committee's interpretation of your wishes, and the substantial aid thereby afforded the families of deceased members so clearly illustrated the wisdom of this action, that it was resolved to maintain the increased allowance as long as possible, and to include therein all those joining the Association in 1881. That a sufficient balance remained from the operations of 1881 to justify the continuance of this award during the entire year 1882 is a source of much gratification to your management, which is also encouraged by the good results attained the fiscal year just closed: the Association will never arrive when the resources of the Association will be so heavily taxed as to necessitate a return to the \$100 each single natural death rate. The new regulation of the company, that all persons admitted to its service shall not be over 45 years of age, and shall pass a strict medical examination, will very materially aid in maintaining this increased allowance. It has already perceptibly elevated the standard of physical health of the service.

The active membership of the association represents 25,000 single rates (or benefits), and the computations of the actuary show that if the surplus, \$30,112.67, were returned pro rata, it would only reduce the premium on each rate 10 cents a month (\$1.20 1/2 per year, while it is sufficient to justify the continuance, during the year ending Sept. 30, 1883, of the extra \$100 each rate of natural death benefit. Your managers have, therefore, in pursuance of the policy above outlined, decreed that such additional natural death insurance shall, for said period, be awarded all who joined the association prior to Sept. 30, 1882.

The detailed reports of payments contained in the monthly statements, which have been regularly published

and conspicuously posted at all prominent points on Baltimore & Ohio lines, render unnecessary the publication herein of itemized statements of disbursements or of the accounts on which made. Appended are statements of mortality, casualty and sickness among members since the last report. Taken in connection with the information previously published, they furnish a resumé of the operations of the Association, valuable alike as exhibiting the scope and magnitude of the work performed, and as furnishing interesting data for studying the health of various localities. It will be noted therefrom that during the period stated there were:

From May 1, 1880, to Sept. 30, 1882.

	MAY 1 TO DEC. 31, 1880.		JAN. 31, 1881, TO SEPT. 30, 1882.		TOTAL.		Average per pay-ment.....
	No. of pay-ments.....	Costing.....	No. of pay-ments.....	Costing.....	No. of pay-ments.....	Costing.....	
Deaths from accidents.....	10	\$11,000	81	\$83,500	91	\$94,500	\$1,038
Deaths from other causes than accidents.....	27	4,900	163	43,400	190	48,300	256
Disabilities from injuries received in the discharge of duty.....	507	6,574	3,465	43,947	3,972	50,521	13
Surgical expenses involved in the above.....	333	2,696	2,273	17,403	2,606	20,099	8
Disabilities from sickness or injuries not received in discharge of duty.....	1,157	10,333	7,937	111,356	9,094	127,089	14
Total.....	2,034	\$41,503	13,918	\$290,603	15,952	\$341,106	\$21

The total number of payments made from the commencement of the Association to Sept. 30, 1882, was 15,952. The number of communications received during same period was 35,432, the greater number of which required answers.

Of the total disbursements from all causes reported, \$3,808, or about 30.5 per cent., did not entail six consecutive days' cessation from work, or were rejected as not coming under the terms of the constitution. While requiring the same examination and supervision as more protracted cases, they involved no expenditure for benefits.

As the principal object for which your Association was instituted is accomplished in the payment of benefits to those disabled from labor, your management has always had a full sense of the importance of thoroughly investigating the merits of each claim presented. Also while exceedingly anxious to render full and impartial justice to each individual member of the Association, and to administer its constitution and rules liberally and consistently, it has recognized as an equal duty the task of guarding every avenue by which fraud could be perpetrated upon the general fund. In the adjudication of the great number of applications for benefits presented, averaging 800 per month, they have not unfrequently been called upon to consider conflicting evidence affecting the validity of such claims. Ordinarily the investigation of the Medical Inspector, in connection with the certificate furnished in support of a claim for benefits, affords sufficient reliable data for determining its merits; but sometimes the ordinary methods of investigation, though supplemented by correspondence, fail to reconcile direct contradiction between the statements furnished by the claimant and the report of the Medical Inspector, or to furnish sufficient evidence upon which to base an allowance of benefits, in those cases where the examinations contemplated by the constitution and by-laws have not been made. In such cases a satisfactory conclusion has generally been reached through the efforts of disinterested members, whose researches have supplemented the information previously obtained. In order to avail of this assistance to the greatest possible extent, your management secured the nomination, at each prominent point and at other proper intervals along our lines, of three reliable members of the Association, to act for a limited period as advisory committees, who serve without pay, and to whom are referred for investigation and recommendation doubtful cases of the character cited. Some of these committees have been of special service, and the plan has not only resulted in much good, but our members have thereby been drawn into closer bonds of fellowship, and their zeal in preventing or frustrating fraudulent claims upon the relief fund stimulated. The experiment has altogether been so successful that it is contemplated to extend this special service and to place it upon a permanent basis.

As the Baltimore & Ohio Co. has continued to pay the salaries and traveling expenses of your Secretary, Medical inspectors and clerks, the funds of your Association have not been taxed on their account.

Since May 1, 1881, 17,186 certificates of membership have been distributed, making the total number of policies issued to date 28,703.

The active membership of the Association has steadily increased, while fluctuating as the company's forces were augmented or diminished; it now embraces over 94 per cent. of all employes in the service.

Classification of injuries and diseases reported brings into prominence, as causes of disablement, coupling accidents and miasmatic and intestinal disorders. Most of the former are caused by foreign cars, whose sils and coupling apparatus differ materially from the Baltimore & Ohio standard, or happen to new employes, who, through fear of ridicule or false pride, neglect, in coupling, the precautions prescribed by the company. Our experience shows the importance of each member in train service encouraging, by precept and example, the use of the sticks provided by the company for coupling.

Recognizing that measures for preventing diseases far more efficiently promote your prosperity and more nearly fulfill the mission of the Association—which is to administer in every feasible way to the comfort and welfare of its

members—than does even the payment of indemnity to those overtaken by suffering and loss of occupation, your management has attempted to exercise a rigid sanitary supervision over the company's properties and employees, and in such endeavors has received every support and encouragement from the company's officials. Where attention has, from time to time, been called to probable or possible sources of danger to life, limb or health of employees appropriate remedies have been promptly applied; the result being that your medical inspectors now report our entire system as free from predisposing causes to disease.

The excellent results which, in the fall of 1880, attended the use of anti-malarial remedies on the Washington Branch prompted your management subsequently to make a wider distribution of appropriate medicines for preventing or checking those disorders most prevalent along our lines. Through these precautions large sums have been saved to your treasury, and much suffering among members has been averted, notwithstanding the unusual prevalence of miasmatic disorders, not only in our territory, but throughout the country during the past year.

While during the past winter small-pox was epidemic in many localities in which you reside, and so virulent as to excite grave apprehension and to cause many deaths, the free vaccination with the best of bovine virus of over twelve thousand employees (and in infected districts their immediate families), and the exercise of every precaution on the part of the company, undoubtedly saved many valuable lives—the Association losing only two members from this disease. The fact that in nearly 85 per cent. of those vaccinated the operation was successful proves the effectiveness of such measures.

These citations are made as illustrative of the greater good which can ultimately be secured from a more perfect system of sanitation. The ramifications of the service are so extensive, and the conditions under which different bodies of our members are placed are so various as substantially to cover the whole field of practical hygiene. It is clearly to the interest of every member to invite and encourage sanitary supervision and control over himself and surroundings, to the greatest extent compatible with the rights of private life. Only through the hearty co-operation of individual members in observing and enforcing the sanitary measures which may be inaugurated by the company or the Association, can the greatest possible good be accomplished.

Since May 1, 1881, the list of physicians and surgeons under contract to attend members injured in the discharge of duty, under the schedule of fees established by the Association, has been materially augmented, and the service thereunder rendered has been economical and satisfactory. Considerable saving of medical expenses has been effected by availing of the services of those surgeons at divisional stations under contract with the Baltimore & Ohio Co. for its own purposes.

It is gratifying to note an increasing recognition and appreciation of the superior treatment afforded by hospital over private practice, as evidenced by the number claiming the privilege of entering those hospitals under contract with the Association to give its members all the advantages of treatment, nursing, etc., enjoyed by the most favored class of patients. Through their agency a number of lives and limbs have been saved that would otherwise, in all probability, have been sacrificed to unfavorable surroundings or unskilled nursing. The treatment of those members committed to hospital practice has been especially satisfactory and almost uniformly successful. When it is more generally understood that, while the Association assumes the payment of surgical expenses only in cases of injury arising from the discharge of duty, any member—whether disabled by injuries otherwise incurred or by disease—is entitled to board, treatment and nursing at the best hospitals in Baltimore, Washington, Pittsburgh, Wheeling, Columbus and Chicago, at the reduced rates enjoyed by the Association, it is not doubted that they will be still more generally utilized.

Many members have availed of the arrangements perfected by your management with representative manufacturers in various sections, to secure artificial limbs combining latest improvements, at the reduced rates paid by the government for those furnished its soldiers and pensioners, and have thereby been enabled to accept active employment, to their own and the Association's advantage.

While from time to time such additions have been made to your corps of medical inspectors as materially increased its efficiency, by affording opportunity for more thorough inspections and investigations, the mental and physical endurance of each inspector is still severely taxed, and it is only by unceasing activity they are enabled to satisfactorily perform their legitimate duties. While simultaneously exercising an effective supervision over the sanitary condition of the large territory assigned them, they have also been charged with the physical examination of all applying for service with the company, and it has become very important to lighten their labors as much as possible. By section 7 of the fourth by-law it is made the duty of every member entitled to allowance from the Association to see that his claim is prepared in due form and forwarded to the nearest medical inspector or to the Secretary. In the early life of the Association, when its rules and practice were new and but imperfectly understood, the duty of preparing certificates and data upon which to predicate claims for benefits necessarily devolved upon the medical inspectors. The present seems a propitious time for following the practice of other benevolent societies, and relegating to those peculiarly interested the duty of securing satisfactory proof of total disablement, as required by our constitution and by-laws. Accordingly instructions have been given the medical inspectors to furnish each member claiming disablement allowance with the necessary blanks and instructions, and it then becomes the latter's duty to see that they are properly filled and forwarded for action.

In furtherance of the project announced in the report of May 1, 1881, of supplying disabled members with entertaining reading matter, boxes similar to those used by hospitals for collecting literature were conspicuously placed at the most prominent stations on our lines, and through this medium and the direct donations of those interested in the Association, much matter has been gathered and by the medical inspectors liberally supplied to such as desired it. Considerable quantities have also been forwarded to Garrett, Ind., for the use of the Employees' Library there situated. It is in contemplation at no distant day to so enlarge this system as to offer every member, ill or well, all the advantages of a well-appointed free circulating library.

I regret to report that the annuity feature has not prospered in the same ratio as that providing relief for disablements. The subject of annuities is a new one in this country, and the small countenance given the pension features of other benevolent associations shows that our people have not yet realized the importance and value of this form of protection against want in old age.

While the permanency of your Association was, from its initiation, assured through the guarantee by the Baltimore & Ohio Co. of all the provisions of its constitution, the expressions of pleasure and gratification with which its founders have publicly referred to its present development

and financial condition testify that it is fairly fulfilling their anticipations in preventing want and suffering. But your management regard its mission as far from accomplished, even though it provide practical indemnity for loss of occupation and a provision for the families of deceased members. They observe with pleasure that the success which has attended this pioneer effort to improve the condition of railroad employees has already prompted the inauguration of several similar associations throughout the country, and that not only railroad employees, but those managing great railroad properties are watching with interest and approval the results which are being worked out through your organization. They recognize and accept, as your representatives, a grand opportunity, through its further development, of illustrating to the mass of railroad employees of America the great works that can be accomplished by intelligent combinations for physical and mental improvement. Having reduced the operations of the relief features to a systematic and routine basis, your management, with the cordial co-operation and support of the Baltimore & Ohio Co., perfected the details of the plan foreshadowed in the first annual report, by which opportunity might be afforded you of investing your earnings with security and profit, or of acquiring homes of your own at lowest possible cost, and in July last announced the inauguration of two supplementary features—the savings fund and building association. In the prospectus of the new plan the Baltimore & Ohio Railroad Co. announced that, having in view the promotion and security of these new features, it would guarantee on all deposits a fixed rate of interest of 4 per cent. It also offered the services of its bonded agents in collecting and disbursing, and of its treasury in holding on deposit the moneys pertaining thereto, under the same security possessed by the railroad company for the safe, prompt and honest handling of its own funds. This guarantee for the repayment of deposits and of interest at once placed the new features in a position of absolute security as regards depositors, and assured them a rate of interest equal to that now paid by savings or other banking institutions, while placing within the reach of every employee on the Baltimore & Ohio Railroad system all the facilities for depositing and withdrawing funds enjoyed in large cities and towns, and giving depositors themselves an influential representation in the management.

The company also offers to such employees as avail themselves of the assistance of the Association in securing homesteads along its lines, or improving those already owned, a reduction of 25 per cent. from its regular rates on all building material entering into the construction or improvement of such homesteads, and on household effects.

The objects for which these new features were established were briefly defined in the prospectus to be "the encouragement of habits of prudence, economy and thrift, by placing within the reach of every employee of the railroad company, upon the simplest and most advantageous terms compatible with proper security, all the benefits derivable from the safest and most liberal savings institutions of the country, and from the best conducted building societies. To this end each officer or employee of the Baltimore & Ohio Railroad Co., who has been a subscriber to the relief features of the Association for the immediately preceding three months, or his wife, may deposit in the savings fund, in the manner and under the regulations set forth in the by-laws, any sum not less than \$1 nor more than \$100 in any one day. The money thus accumulated will be invested and managed for the benefit of depositors."

While among other advantages offered are the following: Facilities to members and the wives of members of the Association, no matter how isolated their location, for investing savings or making temporary deposits in a fund offering (through the guarantee of the Baltimore & Ohio Company for the return of all deposits with accrued interest) unsurpassed by any other savings institution in the country.

Opportunity for every member of the Association to provide, or to improve, homes for their families, by borrowing from the savings fund, at the uniform rate of 6 per cent. interest, and upon the easiest terms as regards repayment of principal, viz., in monthly instalments of \$1 upon every \$100 borrowed, with the option to borrowers of making larger payments.

Payment of interest at 6 per cent. per annum, not upon the whole sum borrowed until all the loan is repaid, but only upon so much thereof as, at the commencement of each year, remains unpaid; an advantage over most building societies.

Certainty of securing valid titles and conveyancing, searching records, recording deeds, etc., at reduced cost, through the employment of the company's numerous counsel resident in various localities.

Free and complete possession of property purchased with loans from the savings fund during the repayment of the loan, thus substituting the repayment of loans for the payment of rents, and acquiring ownership of homes at little or no additional monthly payments.

Ability to purchase materials at large reductions upon current rates, through contracts made by the Association with wholesale dealers for building and other material in large quantities.

Opportunity to utilize, free of cost, the officers of the Association, as agents in negotiating real estate and other transactions, such as securing fire and life insurance at reduced rates, prompt payment of taxes, water rates, etc., etc.

Reduced transportation for all material entering into the construction or improvement of homesteads, etc.

The free services of an experienced architect in supervising building and in seeing that good material is furnished by the parties from whom the member makes his purchases. Or the Association will agree to purchase material and erect the house for a member as cheaply as (and probably for less than) he can build it. Plans and specifications of houses and samples of materials from which to select will also be furnished on application.

Under this programme, those leaving the company's service can continue their payments as before, or can dispose of their interests to the best advantage, as can also those unable to meet their payments.

Upon completion of the house the member takes possession, and uses the money previously expended in rent to meet the monthly instalments on his loan, toward the liquidation of which he also devotes the amount already deposited in the fund. The house is security for the loan, and the security is increased as the loan is decreased. When the loan is wholly repaid the title passes to the borrower. Thus, at little or no increase over what he had formerly paid for rent, a member can in a few years acquire ownership of a home equal to, or better than, the one previously rented, and meanwhile all improvements made upon the property are his own.

While forming part of the general plan of relief for employees already in operation, the savings fund and the building features are conducted under the separate management of a board of trustees elected solely by those peculiarly interested in these new features.

Although so recently inaugurated, the rapid growth of these additional features encourages the belief that their success will ultimately rival that of the relief features. Many members have already utilized the savings fund, and their deposits aggregate such sums as must encourage in

others similar prudence and economy. A considerable portion of the moneys thus accumulated has already been loaned other members to release burdensome mortgages or to purchase or improve homesteads, and the additional applications already received from those desiring to build under the new programme are sufficient to absorb nearly all the remaining available surplus.

Depositories for the reception of moneys have been established in such localities as can be easily reached by any employee, however isolated, and such contracts have been made with manufacturers and dealers in building supplies as will enable the Association to properly construct houses possessing necessary conveniences at figures which cannot be met by those who look for profit.

In view of the dimensions attained by the Association, and the real estate and money transactions involved in the new features, it was thought necessary by your counsel and managers to secure for it recognition as an independent corporation; for which purpose a special charter was obtained from the Maryland Legislature in May last.

The only modification of the text of your constitution since my last report was the unimportant one referred to in the opening paragraph of this paper, as changing the fiscal year of the Association so as to correspond with that of the Baltimore & Ohio Co. The few changes in the regulations suggested by the experience of the past 29 months have been embodied in four by-laws, and, from time to time, reported in the monthly statements of benefits paid members.

The methods of procedure in the preparation of claims, etc., are now well understood, and the affairs of the Association are consequently conducted economically and expeditiously.

It is with very sincere pleasure I am able to point to the flourishing condition of your society, both in its financial and administrative departments, as very largely resulting from the untiring energy and industry of your medical inspectors and those composing the clerical force of the Association—prompted by zeal and interest in their work as gratifying as it is admirable.

An appendix to the report contains tables showing all the various causes of death and disability of members of the Association, giving those employed in the Transportation, Road and Machinery departments separately. These tables are too voluminous to be reproduced here, but they form an interesting study, and when a few more years are added to the experience of the Association they may be made the basis for some valuable deductions.

An English View of American Special Technical Associations.

The London *Engineer*, taking as its text the last annual report of the Master Car-Builders' Association, publishes the following article, which, it will be seen, is largely devoted to the discussion of the peculiar kind of technical associations common in this country, but hardly known in England:

This report, which appears as a small 8vo volume of 250 pages, is a favorable specimen of the kind of work which is being done by what may be called the specialist societies of the United States—societies which have their parallel on the Continent, especially in Germany, but which are practically unknown in England. We have, of course, technical societies in plenty—some, like the Institution of Civil Engineers or Society of Arts, which cover a very wide ground; others, like the Iron and Steel Institute or the Society of Telegraph Engineers, which cultivate only a restricted field. Even with the latter, however, the restriction, at any rate as regards membership, is rather nominal than real. The Iron and Steel Institute, for example, would welcome into their ranks any one who is eligible for the corporate membership of the Institution of Civil Engineers, besides very many who are not. Whatever their aims or restrictions, however, the course of action of such societies is similar. They meet at regular intervals throughout a session of some eight months—say once a week, or once a fortnight. At these meetings such papers as have been offered by members or others, and approved by the governing body, are read and discussed, and the record is subsequently published for the benefit of the society and of the public. Such papers are necessarily of a sporadic and various character, dealing mainly with whatever may be the "burning questions" of the day in that particular department of knowledge; and the discussions are apt to be desultory and disappointing. No attempt is made—with few exceptions—to take up and work out any particular question; to ascertain exhaustively what is the experience of the most prominent members on that particular subject, and to record this, with their opinions on its past history and future progress. It is known, in fact, that such experience and opinions will in most cases be given grudgingly, if given at all; and that it would probably be impossible to collect such a body of information as would fairly represent the facts of the case. As a matter of fact, it is not attempted; the weekly or fortnightly meeting, with a good paper on some subject or other, and, if possible, a good discussion to follow, is all that a member looks for as the ultimate object of such an association.

This sort of thing does not suit our brethren in America. In the first place—confining ourselves to engineering societies—the country is so vast that it is impossible to collect the engineers of any one class together for weekly or fortnightly meetings. Hence the form naturally assumed is that of an "Annual Convention," which is held at some important centre, and to which an engineer, even from a distance, finds it quite worth while to give up a week. Then, when the convention has met, the intensely practical turn of mind characteristic of the American engineer indisposes him to listen to papers on subjects with which he has no direct concern. In England a mechanical engineer sits contentedly through a paper on blast furnaces, and a civil engineer listens amicably to a discussion on the difference between English and American practice in locomotive boilers. He feels that he is picking up some knowledge on an interesting subject, which is at least akin to his own business; and that it is impossible to say when such knowledge may turn out of practical value to him. We by no means wish to imply that he is not quite right in his view; but at least it is not that of an American. Long before the paper was over, the latter would "calculate that he had something better to do with his time"—something, namely, which he could see a more immediate prospect of turning into hard cash. This feeling naturally tends to split up societies into small groups, each working a very limited field, in which all of its members are directly interested. In England, even on the Continent, no one would dream of proposing one society for locomotive superintendents and another for carriage superintendents; but in the United States we find the Master Mechanics' Association and the Master Car-Builders' Association both in full vigor. Now, it is obvious that, the ground being thus subdivided, each plot can furnish a sufficiency of intellectual food for those concerned in it only by

being most diligently cultivated. Add to this that an American engineer believes in theory, believes in practice, believes most of all in going ahead. When a subject is started, he wants to know what everybody thinks about it, and what everybody has been doing with it hitherto, in order that he may strike out something which shall outshine them all. Hence the regular course of things in an American technical society is as follows: Somebody starts a subject; he suggests, we will say, that it would be well to know something about the best forms of continuous brake for goods trains. In England this would only mean that the secretary would endeavor to get somebody, probably an inventor of goods-train brakes, to read a paper upon them, and that paper, if obtained and read, would receive a certain very limited amount of discussion. In America it means something quite different. The society forthwith appoints a committee to deal with the question. The committee sends round to every inventor of such brakes, and to every railway engineer who is known to have tried them, a schedule of questions to elicit his experience and his opinions. These not only send these round, but—*mirabile dictu*—they get answers to them, at least in the majority of cases. Their answers form the basis of a report, which is laid before the society at its next convention. It is needless to state that a number of opinions, obtained independently from different persons, will be found to present very marked discrepancies and even contradictions. Those who have thus put forward opposing views are pretty well bound to maintain them. A good discussion by really capable men—the most difficult thing to insure in such meetings—is thus provided for, and the subject either gets thrashed out completely on the spot, or is referred back to the committee for further inquiries, further experiments, if need be, and for a second report to be presented and considered at the next convention.

It is difficult to resist the conclusion that much good must result from such thorough and painstaking investigation of a subject. Why such a thing does not exist in England, and whether it could be introduced, are questions we shall not attempt to enter upon here. Any one, however, who wishes to judge for himself as to the manner in which such inquiries are conducted may be recommended to glance through the volume before us. The convention of the Master Car-Builders' Association was held at Philadelphia on the 13th to 15th June, 1882, under the presidency of Mr. Leander Garey. The President's address, which was very short, pointed to three questions as specially requiring the attention of the Association, namely, the automatic coupling of cars, the exact gauge to which wheels should be set with reference to lateral play between flange and rail, and the repairs to loaded cars while in transit. Reports were then read and discussed on the following subjects: Train brakes for freight cars; accidents to trainmen; standard draw-bars and draw-springs; carrying capacity of freight cars; materials for car construction; amendment of the constitution of the society; brake heads and shoes; a standard wheel gauge; repairs to cars in transit; the Tallman brake; automatic draw-bars for freight cars; standard screw-threads for cars; and on a joint meeting with the Master Mechanics' Association. Some of these reports contained little or nothing beyond the fact that the committee was pursuing its investigations; others gave most valuable information on the topics concerned, and led to long and animated discussions.

We will take one of these discussions as a specimen, because it relates to a subject very recently discussed in these columns, namely, the proper form to be given to the tread of railway wheels. In that discussion it was noted as very remarkable that the question whether a wheel tread should be conical or flat was not yet settled in England; inasmuch as at least one eminent authority considered the practice of coning to be a mistake. It appears that the same difference of opinion exists in America, but in a much more marked degree. That the question, after forty years of railway working, should yet remain to be fought out is itself a powerful argument for the existence of such bodies as the Car-Builders' Association. It arose at the present meeting indirectly, in the course of a discussion as to wheel gauge. Mr. Davenport observed that a railway master car-builder had maintained to him, as the result of many tests, that a wheel straight on the tread, or cylindrical, will run more evenly and more steadily, and go round a curve as easily, as a coned wheel. On the last point, which is, of course, the special point of discussion, he made the following very pertinent remark: "Does it not make a difference whether you are pulling a car round a curve or pushing it round a curve? If you are pushing, then, of course, the inclination of the car is to go off on a tangent, and hug the outer rail. Then, of course, the cone would be a help. But if you are pulling the car, then you are forcing it toward the inner rail, and the momentum of the train is carrying it toward the outer rail. But in freight trains, which of course is the principal thing, the draught of the train is all the time tending to force the wheel against the inner rail."

It would certainly seem at first sight that there is much force in this. The subject has always been treated, we believe, as if the vehicle were running round the curve by its own momentum, independent of any pull in front. This is true, of course, of the engine, and so far the arguments in favor of coning would apply; but it is not true of the vehicles which it is dragging round the curve after it. These have a forward pull upon them, which acts as a tangent to the curve and does actually tend to lead them round it. But a moment's reflection shows that this is not, even yet, the whole of the story. The vehicle has also a backward pull upon it, due to the remainder of the train, and this pull tends to twist it in the opposite direction, or to throw it off the curve. If the two pulls were equal, as well as symmetrical, the vehicle would thus be in the same condition as if it were free, and the arguments for coning would still hold. But they are not equal, the forward pull being of course the greater, by just the amount of resistance to traction due to the wagon itself. Hence there will be a resultant movement, tending to make the vehicle follow the curve; in other words, to keep the inner leading wheel close to the inner rail. How far this will succeed in actually turning the vehicle in the required direction, and so preventing the flange of the outer leading wheel from bearing against the outer rail, must be determined by observation; but if it does so to any considerable extent, then the advantage of coning, as enabling the outer wheel, which has farthest to go, to run on the larger circle, is so far rendered nugatory.

The discussion of the point at Philadelphia revealed an extraordinary variety of opinion. It was asserted by one or two speakers that on a curve the flange of the outer leading wheel was always hard against the rail, and the rapid wear of the inside of the rail-head was quoted as a conclusive proof. To this it was replied that the argument as to the cars did not, of course, affect the engine; in fact, the engine is forced against the outer rail not only by its own momentum, but by the twisting action of the pull on its draw-bar, and has probably a greater grinding effect than all the carriages put together. Again, the question was said to have been asked, "How long does the coning last?" and it was admitted that it was completely worn off long before the wheel came back for re-turning. It appeared further that the Lehigh Valley Railway had been testing unconed wheels for a year, on a very crooked road, with great suc-

cess; that on the New York Central an engine had been turned from a hard-running into an easy-running one by taking off the cone; and that another railway had been using unconed wheels on its locomotives for ten years. Therefore, even for engines, there is some ground for thinking, as one speaker expressed it, "that the coning of wheels is an old foggy idea, and ought to be done away with." Eventually a committee was appointed to examine into the question. Doubtless they will present a valuable, probably a conclusive, report to the convention of 1883; and within ten years after the question has thus been disposed of, it is not, perhaps, too much to hope that English engineers may generally wake up to the fact of its existence.

A Trip on the London Underground.

How many Londoners have ever traveled in one stretch right round the underground railway? The proceeding may seem irrational, yet it is worth while once in a way—and, indeed, no man is likely to try it more than once—if only to realize the full portentousness of our metropolitan inferno. Some of these days, when the circle is quite finished, we shall, no doubt, turn it to its natural use as a place of punishment. Prisoners will be condemned to so many continuous "round trips," as they now are to so many weeks in jail or so many lashes. But in the present imperfect state of our civilization we may yet for some time continue to travel by it. It is an incident of a semi-barbarous condition—very useful indeed, but not the less scandalous on that account. You laugh at such extravagance; come, and see! Make your entrance by this artistic shed; it will soon be a Philistine station, which calls itself Tower Hill. The train is just starting. Don't be alarmed at that series of loud, sharp reports. It is only the porters shutting the doors with their usual gentleness—that is the signal for departure. Some uncouth noise you will soon find is the signal for everything in the nether world. The *umbrae silentes* are a mere fiction of the poet. Open the door and jump in, but jump clear—the train always starts as you are jumping. And now you are in it, all in a moment, "mongst horrid shapes and shrieks, and sights unholy." There is a lamp overhead which just shows you the darkness, a window by your side which just lets in the smoke. The carriage jolts and rattles and groans and scrapes and squeals, but all several noises seem to merge in one dull generality of noise in the deadened atmosphere. The whole train—nay, the whole nether world—is rumbling inside your head. You close your eyes, but in a moment the air is rent with tuneless screams. A dozen treble voices, variously cracked, solicit your custom for rival evening papers, papers that you can't read if you buy them. That is the signal for a halt. The brake responds with a growling jar which sends a sympathetic tremor up the back—we are at a station. Distracted crowds of men and women surge hither and thither; then there is another discharge of artillery, another jerk, and the rumbling and shrieking have recommenced. When this has happened three or four times, the sense of hearing has adapted itself to circumstances and the pleasures of sight begin. For they are not unadorned, these capacious vaults in which the Stygian horse receives and disgorges its victims. All colors that strike the eye, colors of business that have no name in the world of art, emblazon the wall in hideous rivalry. Keen and Colman are intertwined in a mortal struggle for supremacy in the yellow realms of mustard, while the tender green of Camuset's Champagne seeks to interpose with soft suggestions of sybaritic delight at 42s. a dozen. And oh, Cock and Cocker, and Cockerell, Hignett and Hogben and Fluxton and Oetzmann, and all we other great of the earth—oh, Milk Food and Ebonite Blacking and Fruit Salts and Crushed Cocoa Nibs—what a spectacle do you conspire to present to the artistic eye! Meanwhile, we have got to King's Cross. The first stage of your probation is over. Prepare for a worse.

The region of alternate night and twilight is behind you, but "cloud instead and ever-during dark" surround you in the very heart of Avernus. Sight and hearing have both become numbed by this time, but taste and smell yet remain to be assailed by the mephitic fumes that grow thicker and thicker, fouler and fouler every moment. Shut the window and you are stifled. Open it again and you are choked. And now observe, if you have a taste for toxicology, how the same poison works differently on different orders of beings. The stiff spinster opposite you is shaken with a convulsive cough. The stout old gentleman by your side is nodding toward your shoulder in drowsy torpor. The very train seems to groan more heavily, to grind along more slowly than before. Nay, now it has altogether ceased grinding and this time it has halted in the dark. Is it an accident? Never mind. You are as indifferent to a collision as a sea-sick voyager is to shipwreck. But no, it is not an accident; it is a station, but no capacious vault this time, only an ordinary bit of dark tunnel with a long covered shaft that leads, perhaps, in the far distance to the light of day, for, see, men come stumbling down it cheerfully. They are unconscious of the fate before them. But those who ascend it do so with heavy steps and dazed mien. "Hoc opus, hic labor est." Your eyes smart and water, your brain reels. When shall this tyranny be overpast?

Hope revives at Edgware Road, to die again about Sloane Square. During the interval a little of the upper air—or upper fog, according to the season, has once more struggled into the carriage to fight a desperate though losing battle with the foul gas which but now ruled supreme in its narrow confines. The excitement of the struggle serves to cheer the drooping spirits of the passenger during that last weary season of release, for the end of your journey is worse than the beginning. Of him that makes the infernal circuit one may say, adapting the words of the poet:

Smoke, stench and smoke in eyes, ears, mouth and nose,
From the black deep to the black deep he goes.
—*Pall Mall Gazette.*

American Electric Signals.

The American Railway Signal Company of Illinois now owns sixteen patents upon the latest improvements in electric signals for railways. The system consists merely in a battery, one wire strung on poles, targets at each end of the section which inclose the split banners and the track instruments, and is operated in the following manner: The car in entering the section passes over first a circuit or current maker, then about six feet beyond over a circuit breaker. As each car passes over these track instruments the banners indicate that the current is alternately made and broken. When the last car has passed the breaker the banners fall to and remain at danger until the train has completely passed over the circuit closers at the other end of the section, when the current of electricity commences to act, and the banners are drawn up out of sight, and the section is shown to be clear.

The circuit-makers are at the extreme ends of the section, and the breakers between them, and distant only about six feet from the closers.

The banners are held up by electricity, and when there is no electric current the banners must fall by their own weight to danger. For simplicity, nothing excepting the telegraph can equal it.

The operation of the system is perfect, as appears by its

trial at Aurora on the Chicago, Burlington & Quincy, where from 1,800 to 2,000 cars pass daily over it, and it works successfully.—*Chicago Inter-Ocean.*

A Terrible Struggle for Life.

A dispatch from Boston, March 27, says: "A horrible and in some respects a remarkable accident occurred this evening near Readville Station, on the New York & New England Railroad, a few miles from Boston. The draw-bar between the locomotive and the tender, on an outgoing freight train, broke while climbing a heavy grade. The fireman, Francis Sturgis, fell into the gap, and in falling he grasped the brake rod and was dragged for a quarter of a mile, his feet striking against the ties and wearing the flesh from the bones. He clung to the brake during this terrible period, in sight of the engineer, who witnessed the struggle for life without the power to render aid. He whistled for down brakes, but the brakemen did not respond, and it is alleged they were not at their posts of duty. Finally, the poor fellow's strength giving out, he fell beneath the train and was killed."

ANNUAL REPORTS.

The following is an index to the annual reports of railroad companies which have been reviewed in previous numbers of the present volume of the *Railroad Gazette*:

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Cleveland & Pittsburgh.....	Pittsburgh & Lake Erie.....
Columbia & Greenville.....	Portland & Ogdensburg.....
Connecticut River.....	Portland & Rochester.....
Delaware & Hudson Canal.....	Providence & Worcester.....
Delaware, Lacka. & Western.....	Rochester & Pittsburgh.....
European & North American.....	St. Louis, Iron Mt. & Southern.....
Fitchburg.....	St. Paul & Duluth.....
Grand Trunk.....	South Carolina.....
Hannibal & St. Joseph.....	Union Pacific.....
Hartford & Conn. Western.....	Virginia Midland.....
Houston & Texas Central.....	Wabash, St. Louis & Pac.....
Huntingdon & Broad Top.....	Western R. R. Association.....
Illinois Central.....	Woodstock.....
Lehigh Coal & Navigation Co.....	Worcester & Nashua.....
Lehigh Valley.....	
Long Island.....	

Natchez, Jackson & Columbus.

This company owns a line, of 3 ft. 6 in. gauge, from Natchez, Miss., northeast to Jackson, 100 miles. Of this 40 miles were built last year, the road not being open to Jackson until November. The report is for the year ending Dec. 31.

The debt of the company is as follows:

Funded debt.....	\$201,900
Floating debt.....	170,561
Natchez City bonds endorsed.....	225,000
Total.....	\$597,461

The cost of the road and equipment was \$1,095,450, the balance over the amount of debt having come from stock subscriptions.

The earnings for the year were as follows:

	1882.	1881.	Inc. or Dec.	P. c.
Passage.....	\$24,343	\$10,582	I.	\$13,761 129.7
Freight.....	75,691	43,782	I.	31,909 72.8
Other.....	4,154	3,105	I.	1,049 33.8
Total.....	\$104,188	\$57,469	I.	\$46,719 81.3
Expenses.....	65,865	28,681	I.	37,184 129.4
Net earnings.....	\$38,323	\$28,788	I.	\$9,535 33.2
Gross earn. per mile.....	1,563	1,149	I.	114 10.0
Net.....	575	578	D.	1 0.2
Per cent. of exps.....	63.22	49.91	I.	13.31

The average mileage worked last year was 66½ miles, against 49½ miles in 1881. For the months of November and December, when the road was fully opened to Jackson, the gross earnings were \$31,978, or over one-third of the entire earnings for the year.

Chicago, Burlington & Quincy.

The following statements for the year 1882 are received in advance of the publication of the full report.

The mileage at the close of the year was 3,216 miles against 2,924 miles in 1881, an increase of 292 miles during the year.

The earnings were as follows:

	1882.	1881.	Inc. or Dec.	P. c.
Freight.....	\$15,711,510	\$16,595,819	D.	\$884,309 5.3
Passengers.....	4,750,992	3,616,086	I.	1,134,906 31.6
Mail, etc.....	1,534,802	1,112,245	I.	422,557 34.0
Total.....	\$22,003,304	\$21,324,150	I.	\$679,154 3.2
Expenses.....	10,668,341	10,574,357	I.	93,984 0.9
Net earnings.....	\$11,334,963	\$10,749,793	I.	\$585,170 5.4
Gross per earn. mile.....	7.167	7.482	D.	315 4.2
Net earn. per mile.....	3.660	3.772	D.	112 2.9
Per cent. of exps.....	48.49	49.59	D.	1.10

The income account is as follows:

Net earnings, as above.....	\$11,334,963
Net receipts from land grant.....	1,329,725
Total.....	\$12,664,688
Taxes.....	\$915,622
Rentals.....	148,771
Interest.....	3,883,789
Sinking funds.....	631,443
Total.....	5,579,625
Surplus for the year.....	\$7,085,063
Transferred to renewal fund.....	\$750,000
Dividends, 8 per cent.....	5,023,069
Total.....	5,773,569
Balance carried over.....	\$1,311,494

In 1881 the dividends were also 8 per cent., the amount transferred to renewal fund was \$1,000,000, and the balance carried over was \$1,650,422.

Housatonic.

This company owns a line from Bridgeport, Conn., to the Massachusetts line, 74 miles, with a branch from Brookfield Junction to Danbury, 5.5 miles. It leases the Berkshire road, from the State line to West Stockbridge, Mass., 22 miles; the West Stockbridge road, from West Stockbridge to the New York line, 2.75 miles; and the Stockbridge & Pittsfield road, from Vandusenville to Pittsfield, Mass., 22 miles. The total is 79.5 miles owned, 46.75 miles leased and 126.25 miles worked. The report is for the year ending September 30.

The equipment consists of 24 engines; 27 passenger, 3 mail and smoking and 9 baggage cars; 533 box, 14 hay, 329 flat

and 3 caboose cars: 1 wrecking car. This is an increase of 2 locomotives; 1 passenger, 1 mail and smoking and 1 baggage car; 351 box cars and 1 caboose, and a decrease of 9 flat cars.

The condensed balance is as follows:

Old stock	\$820,000.00
Preferred stock	1,180,000.00
Bonded debt	1,050,000.00
Profit and loss	223,440.73
Bills payable	188,083.37
September expenses, accounts, etc.	94,860.93
Total	\$3,556,310.03
Road and equipment	\$3,257,705.90
Materials	75,027.76
Accounts and balances	117,151.88
Cash	105,824.39
Total	\$3,556,310.03

The bonded debt consists of \$150,000 7 per cent. bonds, due 1883; \$100,000 7 per cent. bonds, due 1885; \$300,000 6 per cent. bonds, due 1889; \$300,000 5 per cent. bonds, due 1910; and \$200,000 rolling stock certificates, 5 per cent., due 1889. These certificates were added last year.

The traffic for the year was as follows:

	1882-81.	1880-81.	Inc. or Dec.	P. c.
Train-miles	539,470	544,810	D.	5.240
Passengers carried	340,478	319,743	I.	20.735
Passenger-miles	8,546,740	7,846,894	I.	609,846
Tons freight carried	353,909	348,614	I.	5.295
Ton-miles	17,510,670	17,277,336	I.	233,334

The increased business was carried with a slightly diminished train mileage. There was a gain, especially in local freight and in through passengers.

Earnings for the year were as follows:

	1882-81.	1880-81.	Inc. or Dec.	P. c.
Freight and milk	\$487,202	\$512,017	D.	\$24,725
Passengers	230,283	217,216	I.	13,067
Mail, etc.	28,753	25,280	I.	3,473
Total	\$746,238	\$754,513	D.	\$8,185
Expenses	493,125	480,531	I.	12,594
Net earnings	\$253,203	\$273,982	D.	\$20,779
Gross earn. per mile	5.012	5.976	D.	64
Net	2.006	2.180	D.	174
Per cent. of expenses	60.07	63.69	I.	2.38

The earnings show a slight decrease and the expenses an increase, resulting in a considerable loss in net earnings.

The additional cars bought in seven months earned \$11,756 in excess of cost of repairs and interest on certificates.

The income account was as follows:

Net earnings, as above	\$253,203.10
Interest and taxes	\$22,249.08
Coupon interest	59,350.00
Rentals of leased lines	74,075.92
Dividends on preferred stock, 8 percent.	94,400.00
	250,275.00

Surplus for the year	\$2,927.50
Profit and loss, balance, Sept. 30, 1881	\$20,513.23
Balance, Sept. 30, 1882	\$23,440.73

The President's report says: "It will be observed that there is an increased bonded indebtedness of \$200,000, the proceeds of which have been invested in 350 line cars and 50 coal cars.

"We have purchased and laid in the track 1,220 tons of steel rails, and made a contract for 2,500 tons for May and June delivery, which when laid will give us continuous steel rail from Bridgeport to Pittsfield. We have purchased three locomotives at a cost of \$42,041.54, and sold one locomotive for \$3,280. Land has been purchased and new freight and passenger depots built, and increased siding at Housatonic, costing \$21,305.13. The general condition of your property is first-class, and it will be found, for the first time, fully capable of meeting economically any freight and passenger demands made on it."

St. Louis & San Francisco.

At the close of the year 1882, which is covered by its last annual report, this company owned and worked the following lines:

	Miles.
Pacific to Seneca, Mo.	292 2/3
Granby Branch	1 1/2
Peirce City, Mo., to Wichita, Kan.	218 1/2
Oronogo, Mo., to Joplin, Mo.	10 1/2
Girard to Galena, Kan. (including Belt Road at Joplin)	47 1/2
Carbon Branch	3 1/2
Plymouth, Mo., to Fort Smith, Ark.	132 1/2
Springfield to Ozark, Mo. (White River Branch)	19
Total	724 1/2

The increase in mileage during the year was 64 1/2 miles. The average mileage for the year was 676.68 miles, against 624.41 miles in 1881.

The Central Division of the Atlantic & Pacific Railroad (operated by this company) has been extended during the year from Vinita, Cherokee Nation, Indian Territory, to Tulsa, Creek Nation, I. T., on the east bank of the Arkansas River, a distance of 65 miles, giving it a total length of 98 1/2 miles, and making a total mileage under the control of and operated by this company, of 823 1/2 miles.

In addition to this mileage, trains run by contract over the Missouri Pacific road, Pacific to St. Louis, 36 1/2 miles, and over the Atchison, Topeka & Santa Fe, from Wichita to Halstead, 24 1/2 miles, making a total mileage used of 885 1/2 miles.

The equipment consists of 79 locomotives; 33 passenger, 2 combination, 5 postal and 11 baggage cars; 1,187 box, 485 stock, 20 flat, 1,000 ore and 43 caboose cars; 2 officers cars, 1 pay car, 5 boarding, 2 tank and 2 wrecking cars. The company also owns one-half interest in 3 Pullman sleeping cars.

The general account is as follows, condensed:

Stock, common	\$10,500,000.00
" preferred	10,000,000.00
" first preferred	4,500,000.00
Funded debt	20,364,000.00
Bills, accounts and balances payable	2,547,268.08
Income account, balance	1,374,095.78
Total	\$49,285,363.86
Road and property	\$42,061,061.82
Securities and accounts	492,740.31
Co.'s stock owned	551,785.00
Materials on hand	108,756.09
Sundry construction accounts	4,634,935.14
Bills, accounts and balances	1,270,237.43
Cash	156,848.27
Total	\$49,285,363.86

The increase in cost of road and property is \$3,780,722.04, due partly to large additions to equipment, but chiefly to the absorption and extension of lines formerly controlled by, now owned.

The bonded debt consists of \$7,144,500 South Pacific bonds; \$500,000 A bonds; \$5,166,500 B and C bonds; \$603,000 equipment bonds; \$1,100,000 Missouri & Western bonds; \$1,250,000 trust bonds of 1880; \$2,000,000 St. Louis, Wichita & Western bonds, and \$2,500,000 general mortgage 6 per cent. bonds.

The total amount of bonds authorized under the general mortgage is \$30,000,000, a sufficient amount being reserved to retire all other issues.

The traffic for the year was as follows:

	1882.	1881.	Inc. or Dec.	P. c.
Train miles	680,911	621,225	I.	65,686
Passenger	1,416,414	1,302,441	I.	113,973
Freight	33,389	37,097	D.	23,708
Service				41.6
Total	2,136,714	1,980,763	I.	155,951
Car miles				7.9
Passenger-train	2,877,538	2,480,821	I.	416,717
Freight	20,051,834	18,264,163	I.	1,787,671
Total	22,929,372	20,744,984	I.	2,204,388
Passengers carried	348,811	293,228	I.	55,582
Passenger-miles	20,148,500	18,529,140	I.	1,619,360
Tons freight carried	753,573	683,544	I.	70,029
Ton-miles	137,334,335	123,867,774	I.	13,466,561

Av. train load: Passengers, No. 39 30 D. 1 3.3 Freight, tons 97 95 I. 2 2.1 Locomotive service cost 15.80 cents per mile run, against 15.85 cents in 1881, a decrease of 0.05 cents, or 0.3 per cent.

Of the ton-miles, 53.5 per cent. was of east-bound and 46.5 per cent. of west-bound business. The average train was 4.2 passenger train cars, or 14.2 freight cars.

The average receipts per train-mile and per unit of traffic were as follows, in cents:

	1882.	1881.	Increase.	P. c.
Per train-mile	169.84	164.30	5.54	3.4
" net	102.29	94.89	7.40	7.8
Per car-mile	15.58	15.25	0.33	2.2
" net	9.38	8.81	0.57	6.5
Per passenger-mile	8.08	3.50	0.09	2.7
Per ton-mile	1.93	1.89	0.04	2.1

The Land Department reports that the total amount of land granted to the company was 1,689,061 acres. Total sales to Dec. 31, 1882, have been, after deducting canceled sales, 1,181,840 acres, leaving 486,221 acres unsold. The statement shows that the department holds \$469,052.24 cash; land contracts to the amount of \$563,307.38, and unsold land and town-lots of an estimated value of \$987,011.90, making its total assets \$2,019,371.52. The total sales in 1882 were 235,369 acres for \$367,071.85. Cash receipts on land sales and contracts for the year were \$371,733.37. The expenses, including taxes paid, were \$65,870.82.

The earnings for the year were as follows:

	1882.	1881.	Inc. or Dec.	P. c.
Freight	\$2,648,383	\$2,342,610	I.	\$305,773
Passenger	741,389	665,331	I.	76,058
Mail, etc.	182,409	152,582	I.	29,827
Total	\$3,572,241	\$3,160,523	I.	\$411,718
Expenses	1,625,783	1,617,965	I.	7,818

Net earnings, as shown above, \$1,946,458.40. Interest and taxes, \$22,249.08. Coupon interest, 59,350.00. Rentals of leased lines, 74,075.92. Dividends on preferred stock, 8 percent, 94,400.00.

Surplus for the year, \$2,927.50. Profit and loss, balance, Sept. 30, 1881, \$20,513.23. Balance, Sept. 30, 1882, \$23,440.73.

The President's report says: "It will be observed that there is an increased bonded indebtedness of \$200,000, the proceeds of which have been invested in 350 line cars and 50 coal cars.

"We have purchased and laid in the track 1,220 tons of steel rails, and made a contract for 2,500 tons for May and June delivery, which when laid will give us continuous steel rail from Bridgeport to Pittsfield. We have purchased three locomotives at a cost of \$42,041.54, and sold one locomotive for \$3,280. Land has been purchased and new freight and passenger depots built, and increased siding at Housatonic, costing \$21,305.13. The general condition of your property is first-class, and it will be found, for the first time, fully capable of meeting economically any freight and passenger demands made on it."

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reserved to the company to issue any further bonds under this mortgage at such rate of interest as may be hereafter determined, but in no event in excess of 6 per cent. * * *

"In my last report I stated the measures which had been taken and were then pending, looking to the consolidations of the companies owning the various branch lines operated by this company, and the subsequent consolidation with or acquisition by this company of the same. These have all been duly consummated, and at the last annual meeting of our stockholders all further necessary action on the part of this company, in these particulars, was duly taken.

"The lines of road thus acquired are as follows: Plymouth, Mo., to Fort Smith, Ark., 133 miles; Oswego to Wichita, Kan., 145 miles; Galena to Girard, Kan., 47 miles, and the same, together with all the rights, franchises and properties pertaining thereto, are now owned and controlled by this company. * * *

"At the last session of Congress an act was passed granting to this company the right-of-way through the lands of the Choctaw Nation, in the Indian Territory, for an extension of our line from Fort Smith, Ark., to Paris, Texas. In conformity with the provisions of the act this company has filed with the Secretary of the Interior its acceptance of the grant and also a map of the preliminary survey of the line. The prosecution of this work awaits the further action of the board of directors.

"The joint ownership of this company, with the Atchison, Topeka & Santa Fe Co., in the road of the Atlantic & Pacific Co. is now well known, and the importance of this interest in the near future is very generally appreciated.

"The Western Division of that road is now completed and in operation for a distance of 470 miles westward from Albuquerque, N. M., on the Rio Grande, and the road for the remainder of the distance to a proposed point of connection with the line of the Southern Pacific, at the Needles, on the Colorado River, is nearing completion, and this connection is expected to be made early in the coming spring. This new through line from San Francisco to St. Louis and Chicago, over the lines of this company, and of the Atchison Co., will then be ready for business.

"Sixty-five miles additional of the Central Division, of the road of that company, from Vinita to Tulsa, on the Arkansas River (99 miles in all), in the Indian Territory, were recently completed and are now in operation from the western terminus of our own main line, at Seneca, and it is proposed to continue the further extension of the same."

New York, Ontario & Western.

This company owns a main line from Middletown, N. Y., to Oswego, 249.6 miles, with branches from Summitville to Ellenville, 8 miles; Walton to Delhi, 16.7 miles; East Guilford to New Berlin, 23.3 miles; Norwich to Cortland, 48 miles; a total of 344.6 miles. It is building (jointly with the New York, West Shore & Buffalo) an extension from Middletown to Weehawken, N. J. The report is for the year ending Sept. 30.

The improvement consists of 73 locomotives; 32 passenger, 8 second-class and 20 baggage, mail and express cars; 454 box, 13 milk, 62 stock, 622 flat and 634 coal cars; 27 service cars.

The balance sheet was as follows at the close of the last two fiscal years:

	1882.	1881.
Preferred stock	\$2,000,000.00	\$2,000,000.00
Common stock	58,113,982.84	58,113,982.84
Accounts and balances	904,911.95	330,438.09
Profit and loss	595,545.60	260,853.07
Totals	\$61,554,440.45	\$60,705,274.00
Road and equipment	\$52,210,122.78	\$51,508,155.19
Other lines owned	7,903,984.51	4,865,916.47
Rails, fuel and supplies	731,068.40	525,098.03
Accounts and balances	87,817.79	216,354.31
Cash and demand loans	621,490.91	3,591,150.00
Totals	\$61,554,440.45	\$60,705,274.00

The company has no bonded debt of any kind. The increase in cost of other lines owned and the decrease in cash are due to expenditures made on the new line from Middletown to Weehawken.

The traffic for the year was as follows:

	1881-82.	1880-81.	Inc. or Dec.	P. c.
Train-miles	234,056	211,242	I.	23,414
Passenger	325,935	304,598	D.	78,063
Freight	284,591	144,553	I.	140,038
Service and switching	164,587	127,935	I.	36,652
Total	910,669	782,328	I.	122,341

Passengers carried, 391,458; 326,670 I. 64,788 19.2

Passenger-miles, 8,362,845; 7,251,209 I. 1,111,636 15.7

Tons freight carried, 469,520; 348,513 I. 121,007 34.7

Ton-miles, 30,687,380; 19,511,452 I. 11,175,928 57.3

The traffic is entirely local. It shows a large increase over the previous year, but is still extremely light.

The earnings for the year were as follows:

	1881-82.	1880-81.	Inc. or Dec.	P. c.
Freight	\$605,478	\$409,156	I.	\$196,322
Passengers	211,790	180,152	I.	31,638
Mails	17,593	14,553	I.	3,040
Other sources	201,704	275,739	D.	74,035
Total	\$1,036,565	\$925,045	I.	\$111,520
Expenses	848,274	707,501	I.	140,773

Net earnings, as shown above, \$188,291; \$217,544 D. \$



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S. WRIGHT DUNNING AND M. N. FORNEY.

EDITORIAL ANNOUNCEMENTS.

Passes.—All persons connected with this paper are forbidden to ask for passes under any circumstances, and we will be thankful to have any act of the kind reported to this office.

Addresses.—Business letters should be addressed and drafts made payable to THE RAILROAD GAZETTE. Communications for the attention of the Editors should be addressed EDITOR RAILROAD GAZETTE.

Contributions.—Subscribers and others will materially assist us in making our news accurate and complete if they will send us early information of events which take place under their observation, such as changes in railroad officers, organizations and changes of companies, the letting progress and completion of contracts for new works or important improvements of old ones, experiments in the construction of roads and machinery and in their management, particulars as to the business of railroads, and suggestions as to its improvement. Discussions of subject pertaining to ALL DEPARTMENTS of railroad business by men practically acquainted with them are especially desired. Officers will oblige us by forwarding early copies of notices of meetings, elections, appointments, and especially annual reports, some notice of all of which will be published.

Advertisements.—We wish it distinctly understood that we will entertain no proposition to publish anything in this journal for pay, EXCEPT IN THE ADVERTISING COLUMNS. We give in our editorial columns OUR OWN opinions, and those only, and in our news columns present only such matter as we consider interesting and important to our readers. Those who wish to recommend their inventions, machinery, supplies, financial schemes, etc., to our readers can do so fully in our advertising columns, but it is useless to ask us to recommend them editorially, either for money or in consideration of advertising patronage.

THE UNION OF THE BOSTON & MAINE AND THE EASTERN RAILROADS.

The directors of these two companies have agreed upon a union which will, if effected (there may be legal obstacles) be one of the most important events in the New England railroad world for some years. These two railroads are the Boston lines to the north-east. Each has a line to Portland, and the Eastern controls the stock of the Maine Central, which commands most of the traffic of Maine and gives the connection with the British maritime provinces. Together they command that part of the country east of a line due north from Boston, including many thriving manufacturing towns, and an immense seacoast where there is a vast tourist and other travel, and also a line to the White Mountains. They are not large railroads, as railroads go now-a-days, but are important Massachusetts roads. The Eastern works 283½ and the Boston & Maine 202½ miles of road. A brief summary of the properties is:

	Eastern.	B. & M.
Miles owned.....	188½	126½
Miles leased.....	165	80
Locomotives.....	102	86
Passenger train cars.....	216	182
Freight cars.....	2,014	1,949
Securities owned.....	\$1,353,958	\$901,131
Capital stock.....	\$4,937,600	\$7,000,000
Debt.....	14,398,305	3,500,000
Stock and debt per mile owned.....	102,918	83,004

There is not a great difference in the mileage owned, nor in the equipment, but the Eastern has a capital account \$3,890,000 greater than the Boston & Maine's. And though the Eastern is the more valuable property, its heavy charges for interest and rentals, though the interest has not been fully paid, have left nothing for its stockholders since 1871, while the Boston & Maine has not failed to pay a dividend for more than 30 years.

The Eastern Railroad outside of New England is remembered chiefly for two things: first, the terrible Revere accident in 1871; second, the apparently inextricable financial difficulties in which it became involved after that accident, when a policy of improvement and a policy of expansion together resulted in increasing its stock and debts from \$8,339,327 in 1871 to \$18,188,534 in 1875, and its fixed charges from about \$300,000 to \$1,200,000, but in increasing its net earnings only from \$635,808 to \$757,419.

For the year ending Sept. 30, 1865, the Eastern paid a 6 per cent. dividend; then for seven successive years it paid 8 per cent. yearly. In 1872, after the Revere accident, which cost for injuries to persons as

much as an 8 per cent. dividend, it paid nothing; in 1875 it failed to pay the interest on its bonds, and the stock which had sold for 125 in 1872 fell below 11, and really it did not seem probable that it ever could be worth anything.

The difficulties of the company were settled then by an arrangement to fund the 6 per cent. bonds into certificates of indebtedness, bearing 3½ per cent. interest for three years, 4½ for three years more, and 6 per cent. thereafter. Any balance of net earnings over the reduced fixed charges was to be applied to the reduction of the debt, which was then about \$15,000,000, until it was \$10,000,000, and until then the bondholders were to have a majority of the directors.

This arrangement has worked well. The property has been developed, its profits increased, and its future made so promising that the certificates of indebtedness, which were below 50 in 1876, bring 112 now, and the stock that was then below 11 is now over 46.

The Boston & Maine has never been distinguished by any great disaster, financial or other. It had a moderate but constant growth of traffic down to 1873, and paid large dividends. In the twelve years to 1875 it paid six 10 per cent. and six 8 per cent. dividends; in 1876 only 3 per cent.; in 1877, 5 per cent.; in the next two years, 6 per cent.; in 1880, 7½; and for the last two years, 8 per cent. Having so small fixed charges (\$322,000 last year), it does not require very large net earnings to pay large dividends.

The plan for the union of the two roads provides for a lease to the Boston & Maine on terms which are substantially as follows:

From the total net earnings of the united properties there will be paid first the fixed charges of both companies. The effect of this is to increase immensely the security of the Eastern certificates of indebtedness. These have but just begun to receive 6 per cent. interest, and the margin of net earnings over fixed charges last year was but \$217,841—for every dollar of debt to be paid there was \$1.14 to pay it with. This year, however, when the full six per cent. must be paid on the bonds, the interest charge will be about \$184,000 greater. The proposed arrangement will increase what we may call the margin of safety of these bonds by the whole amount of the Boston & Maine's surplus of net earnings over its fixed charges, which was \$657,000. They are, in fact, made an exception, ally choice security.

After paying the fixed charges of both companies, \$630,000 will go to the Boston & Maine, equal to 9 per cent. on its stock. This is 1 per cent. more than it has paid for the last two years; but as we have said, it has made considerable improvements which it charged to construction. The contract between the two companies provides against this, and prescribes what shall be considered working expenses. An investigation made in the interest of the Eastern Company resulted in estimating that \$100,000 a year has been so expended, and if so then the Boston & Maine has earned more than 9 per cent. in the years it has paid 8.

Any surplus of net earnings above fixed charges and the 9 per cent. dividend on the Boston & Maine stock up to \$140,000 is to be divided equally between the two companies. When it reaches \$140,000 the Boston & Maine stock will receive 10 per cent. and the \$70,000 going to the Eastern will pay \$1.40 per share on that stock. But after this, that is after the surplus of net earnings over fixed charges reaches \$770,000, the whole addition is to go to the Eastern until it receives \$433,000, or enough for a 6 per cent. dividend and a sinking fund of \$100,000. The amount payable for interest is to be paid after the bonds are retired as well as before, and provision is made for the issue of 6 per cent. preferred stock for the Eastern certificates of indebtedness, the dividends on which will have the same priority as the interest on the bonds for which they are to be substituted. This will make this stock equivalent to a perpetual 6 per cent. bond with a margin of security consisting of nearly the entire net earnings of the two roads. These certificates mature in 1896.

In behalf of the Boston & Maine it may be said that this arrangement requires it substantially to guarantee the interest of the large debt of the Eastern Company, to do which, if the net earnings of the two companies should ever be as small as they have been in some past years, would deprive the Boston & Maine of any dividend, and that the 1 per cent. addition to the dividend provided for prior to any on the Eastern stock is nothing more than the company has earned alone for two years heretofore, though it has not divided all of it. But on the part of the Eastern it may be rejoined that it has the most rapidly growing traffic and controls by far the most important connections; that its large investment in Boston land and in Maine Central stock is likely to increase greatly in value, and that its very

strength may result in checking future progress of the Boston & Maine if the two companies remain independent.

The relative growth of traffic and profits on the two systems is shown in the following table:

Year.	Eastern.			Boston & Maine.		
	Pass.-mils.	Ton.-mils.	Net earnings.	Pass.-mils.	Ton.-mils.	Net earnings.
1874-75.....	75.2	35.7	\$757,419	65.1	25.4	\$793,753
1875-76.....	69.5	34.2	683,594	67.9	30.4	846,653
1876-77.....	68.5	39.1	709,317	61.8	26.0	748,165
1877-78.....	61.7	39.1	871,810	64.3	28.9	825,091
1878-79.....	65.4	45.0	994,785	65.0	32.3	884,066
1879-80.....	77.1	61.7	1,084,928	68.6	40.0	1,021,634
1880-81.....	83.4	63.1	1,124,601	75.0	41.9	1,024,859
1881-82.....	93.9	68.5	1,110,110	81.6	44.9	989,440

In every year but one the Eastern has had the largest passenger traffic, in every year much the largest freight traffic. The passenger traffic of the Eastern declined considerably from 1875 to 1879; that of the Boston & Maine changed very little. In the latter year they were almost equal. But the growth since has been much more rapid on the Eastern, which shows an increase of 43½ per cent. in 1882 over 1879, while the Boston & Maine's increase was but 25½ per cent. And in freight traffic the gain of the Eastern since 1879 has been 52 per cent., of the Boston & Maine 39 per cent.

But though the Eastern has had the greatest growth in traffic, it has not been so with net earnings since 1879; its increase has been about 11½ per cent.; the Boston & Maine's, 11½ per cent.—nearly the same, and this, notwithstanding the fact that the Boston & Maine has charged as expenses a considerable amount expended for improvements and additions to its property and properly chargeable to construction.

As the Eastern has the larger traffic with little more net earnings, it is evident that it has lower average rates or higher average expenses. And we find in fact that last year the rates, cost and profit per ton and per passenger per mile were, in cents:

	Per passenger-mile.			Per ton-mile.		
	Receipt.	Cost.	Profit.	Receipt.	Cost.	Profit.
Eastern.....	1.881	1.344	0.537	2.035	1.452	0.583
Boston & Maine.....	1.950	1.300	0.650	2.400	1.500	0.900

The Eastern's expenses were 71.44 per cent. of its earnings, the Boston & Maine's, though including considerable expenditures for construction, were but 65.29 per cent. The difference is due chiefly to the difference in rates, and this is due chiefly to the fact that the Eastern carries much more through traffic and more of that carried in competition with coasting vessels.

And this leads us to examine wherein the larger increase of the Eastern consists. We have seen that from 1879 to 1882 its gain in passenger traffic was 28.5 millions of miles, against the Boston & Maine's 16.6 millions, and its gain in freight traffic 23.5 millions, against the Boston & Maine's 12.6 millions. But if we will examine the course of the average rates, we shall find that there was an increase of 1 per cent. in the passenger rate on the Boston & Maine, but a decrease of 8½ per cent. on the Eastern; a decrease of 4 per cent. in the average freight rate on the Boston & Maine, and a decrease of 7 per cent. on the Eastern.

We conclude from this that the gain of the Eastern has been to a greater extent in the low-priced and less profitable through and competitive traffic than in the more profitable traffic—which is natural—and that this has not been the case on the Boston & Maine, which is much more a local road. If, then, it is argued that the Eastern has the more rapidly growing traffic, it may be answered that the part of its traffic which grew so fast is that which is worth least, and on which the tendency of rates is most decidedly downward. In profits, we have seen, the Boston & Maine has kept pace with the Eastern throughout this period of more rapid growth of traffic on the Eastern.

But the Eastern's greater command of traffic is worth something. The future of the Boston & Maine will be more secure if it controls the Maine Central, than if the control shall be in a corporation that may become entirely hostile to it. And there can be no doubt that the two roads can be worked together to greater advantage than separately. There can be a considerable reduction of train service with an actual increase in accommodations to the public. There is a considerable number of common stations. The great terminal grounds of the Eastern in Boston which it cannot fully utilize will give needed accommodations to the Boston & Maine traffic. The two roads together can certainly render greater services to the public and make larger profits for their owners if they are worked by a single administration, and the dangers of the construction of parallel lines to serve one as against the other, and of other wasteful competition, will be so nearly destroyed as to make the future of the two companies much more secure, greatly to the improvement of their credit. If the

growth of traffic which these roads have enjoyed for a few years past continues a little longer, it can be but a short time before the Eastern stock will be receiving regular 6 per cent dividends and but little longer before the Boston & Maine will get 10 per cent., part of the increase in profits coming from increased earnings, but more probably from reduced expenses.

The Card Catalogue as an Index for Notes, Memoranda, etc.

The preface to the first edition of that excellent little book, Molesworth's Pocket-book of Engineering Formulae, opens with the following sentence: "Few are gifted with a memory so retentive as not to require the aid of written formulae in working out the numerous calculations constantly necessary in the profession of an engineer."

A similar remark might be made of men engaged in almost any other occupation, excepting that the data required by most persons engaged in the conduct of business, in scientific or other investigations can rarely be condensed into mathematical formulae. The universality of memorandum books, though, indicates a general need of some form of supplemental memory. While these answer very well for merely temporary purposes, the difficulty of finding what is needed when the number of books or memoranda becomes multiplied, and the recollection of what they contain is faded, is so great as to make their contents almost useless.

It is also often desirable to preserve articles found in the newspapers and other fugitive forms of literature. The inevitable scrap-book, which most persons at some time of life begin, and few continue, is resorted to for the preservation of such material. But even if this plan is not abandoned, the scraps accumulate so rapidly that in a short time, if they are not indexed, they become next to useless, for the same reason that memoranda do when their number increases. As a matter of fact, the time and labor required to put newspaper cuttings in a scrap-book, and of then indexing them, is so great that only a very few can spare the one or have the patience and industry for the other. The consequence is that stranded scrap-books are among the most common articles of garrets and closets, and most people conclude quite early in life that the time required to keep them can be more profitably occupied in other ways.

Besides the preservation of such clippings, it happens often, in reading books, periodicals and publications and documents of various kinds which cannot be mutilated, or in intercourse with persons or by observation, that we find information which is quite certain to be needed in future. Unless some note is made of the place where it may be found, it may have passed quite beyond the reach of memory or of search when it is required. Therefore notes of reference, indicating where to look for the records of such knowledge, will have great value; but, like other material of this kind, unless it is classified or indexed in some way it is useless when wanted.

Few perhaps realize how much valuable information may be accumulated if once the habit is formed of making notes of whatever is likely to prove of value. The store of data grows like the accumulation of "papers" in a busy man's pocket or on his desk. If all such knowledge is promptly classified it becomes like a well-organized and drilled army. Each item falls into its place, and any part or the whole can be called for or moved at will. Without such organization our notes and data are like a mob, incapable of obeying our orders or wishes. Of course the kind of material which a person will think it desirable to preserve, or the subjects and occasions on which he will make notes will depend on his age, tastes, interests, duties, occupation and experience. The erasures in memorandum books show, however, to use simile of the army again, that a good many of our facts become disabled, and require to be discharged. New recruits must be constantly added, and the organization must be of such a character that one or more individuals may be taken from or added to the ranks without in any way impairing its efficiency. If notes and memoranda and scraps are recorded in books, the result is that they soon include an immense amount of rubbish which for various reasons becomes obsolete or useless to the collection, and which it is therefore desirable to destroy, but which cannot readily be detached from the book, and if it could be would leave a blank.

Notwithstanding these difficulties, nearly all persons find it essential to keep notes, memoranda and scraps, the usefulness of which is, though, very far from being as great as it might be if some thorough system were employed for organizing, classifying and indexing data of the kind.

Few have so much occasion to make and to use notes, references, etc., as railroad officers and engineers. Their note-books may, and often do, become a kind of inanimate second self, a material memory, a rescuer in doubt, a storehouse of knowledge, and to some extent an epitome of what they have learned, much of which may be forgotten. In his memorial address on Mr. Holley, Mr. Raymond described the systematic method which Mr. Holley employed early in life and continued to the end, of making notes of all useful matters coming under his observation. All these notes and his papers were completely indexed, and this practice was an effective means leading to his remarkable success, wonderful versatility and profound knowledge of the various branches of engineering which he studied and investigated. The usefulness of this practice can hardly be impressed too strongly, especially on young men.

These, then, are the reasons for devoting an article to the description of a system by no means new, but the knowledge of which is not generally disseminated among engineers and

railroad men for preserving and recording useful information.

This system is that usually called the "card catalogue" system, from the fact that it was first employed in making and maintaining catalogues of libraries. The old method of making catalogues for libraries was to record, alphabetically, in a book, the titles of the volumes and the authors' names. It is obviously impossible, even with the minutest subdivision, to keep a catalogue of a growing library alphabetically consecutive. Therefore, the plan was adopted of putting the title of each book on a separate card, and arranging those alphabetically in suitable compartments in drawers, so as to be easily accessible. As soon as a new book is received in the library its title is put on a card and the card is placed in its proper alphabetical position, and thus the catalogue is always perfectly complete and consecutive. This same system is now used in the establishment of Messrs. William Sellers & Co., in Philadelphia, for keeping a list of drawings in their office. Its convenience for such purposes is very great, and its adaptability to the preservation and classification of memoranda was very soon recognized, and those who have used it are very loud in their commendation of its advantages. Before these are explained, the arrangement which is used in a special case will be described.

Cards are used $3\frac{1}{2} \times 5\frac{1}{2}$ in. in size, made of white Bristol board, although a cheaper quality of material would answer. If the cards are to be used by only one or a few careful persons, what is known in the trade as Weston's linen record paper, which weighs 60 lbs per ream for a size of sheets 21×32 in., is heavy enough and costs much less than Bristol board. (Parenthetically it may be added that this is a very excellent drawing paper, and is used exclusively in the drawing room of the *Railroad Gazette*.) The cards may be ruled or not, to suit the fancy of those who use them. Those referred to above are ruled on one side with lines $\frac{1}{4}$ in. apart.

Besides these there are 26 red cards, $3\frac{1}{2} \times 5\frac{1}{2}$ in. each, with one of the letters of the alphabet on its upper edge. As these cards are made $\frac{1}{8}$ in. wider than the others, their upper edges project above the white ones, and the latter can thus be readily seen.

The method employed of recording memoranda, and of classifying them, may be best illustrated by an actual example. A short time ago, the General Manager of the New York elevated railroads gave the writer the weights of the cars used on these roads. As these figures are likely to be needed in the future, they were recorded in a card. Now, in order that the memorandum may be found, it must have an index title which a person seeking the information recorded would naturally look for. In this case the title would evidently be "Cars." But there are already cards with the titles "Car-axles;" "Cars, coupling;" "Cars, number of;" "Cars, Passenger;" "Cars, Price of;" "Car-seats;" "Car-shops;" and "Car-trucks;" therefore there must be a sub-title, which appropriately would be "Cars, weight of." The memorandum on the card then reads:

"Cars, weight of—The cars built by Gilbert, Bush & Co. for the Third Avenue Elevated Railroad of New York weigh 23,570 lbs.

"The cars built by the Pullman Company for the Sixth Avenue line weigh 24,130 lbs."

This card is then dropped into its appropriate place, between the red cards marked B and C, and is thus indexed. The number of memoranda, may, however, soon become so great that divisions by single letters of the alphabet alone will not be sufficient for convenience in finding what is sought. To provide for this, blue cards of the same size as the red ones are provided, which have three index letters in them the same as the headings of a dictionary, so that the cards under each letter of the alphabet may be again subdivided as often as required for convenience.

One of the difficulties, in fact the chief one, in the system is that of knowing at times under what title things should be indexed. Thus should the weight of car wheels be indexed under "weight," "car," or "wheels?" Should "Technical education" come under T or E? Poole, the author of "Index to Periodical Literature," laid down the obvious principle, which, however, is not always easy to apply, that the title should be selected "under which the reader would be most likely to look for the subject." When there is no such obvious title the thing to do is to select that one which appears to be most obvious, and then make cross references. Thus "weight of car wheel" might be indexed under "Wheels" and then under "Car Wheels," say "see wheels," and under weight say "see wheels; weight of." A little practice, however, soon gives facility in dealing with ordinary cases of this kind.

The cards are kept in the drawers of an ordinary library table. Each of these drawers is 19×18 in., and has three compartments $5\frac{1}{2}$ in. wide, 4 in. deep, and 19 in. long, in side measurement. At the end of each compartment there is a block of wood, whose length is equal to the width of the compartment. The cross-section of the blocks is a right-angle triangle, the base of which is $2\frac{1}{4}$ in. and the perpendicular $3\frac{1}{4}$ in. The perpendicular side is placed against the ends of the drawers, and the hypotenuse side thus affords an inclined surface for the cards to lie on for convenience of examination.

Clippings from newspapers, if not larger than one of the cards, are simply pasted on one, and an index title is written on the upper right-hand corner. For clippings larger than the cards, envelopes of the ordinary kind are provided, of the same size as the cards. The clipping is folded and put in the envelope, and the index title written in the same position on the outside of the envelope as it is on the card.

In most cases it will perhaps be found more convenient to select a certain size of envelope from those made regularly

for the trade and then have the cards cut to correspond with the size of the envelopes. An ordinary envelope $8\frac{1}{2} \times 6$ in. would answer very well. Envelopes which are not gummed are a little more convenient to handle.

It will happen that on some subjects so much material will be collected that an ordinary envelope will not hold it all. To provide for such cases, what are called box or document envelopes are used. These are made of heavy Manilla paper 4 in. wide by $9\frac{1}{2}$ in. long and $\frac{1}{2}$ in. thick. The index title of these is written on the ends, and they are kept in pigeon-holes about $4\frac{1}{2}$ in. square by $9\frac{1}{2}$ in. deep. When there is so much material relating to a given subject that an envelope of this kind will not contain it, a whole pigeon-hole is devoted to the one subject. The pigeon-holes are of course separate from the table. These may be arranged in any way that is convenient. In the special instance described an ordinary cheap wardrobe, such as can be bought for a few dollars in any furniture store, was taken and divided up into pigeon-holes $4\frac{1}{2}$, $6\frac{1}{2}$, $9\frac{1}{2}$ and $20\frac{1}{2}$ in. wide. The small ones take the large envelopes, those $6\frac{1}{2}$ in. wide will take ordinary pamphlets, and those $9\frac{1}{2}$ and $20\frac{1}{2}$ in. wide will take larger documents. The wardrobe is 13 in. deep, but the pigeon-holes are made only 10 in. deep. The pigeon-holes should all be numbered, and the index title of the subjects contained in them should be entered on a card, with a reference to the number of the pigeon-hole. The number of the pigeon-hole should also be written on the envelope, pamphlet or other document contained in it, so that it may be returned to its proper place.

For the storage of pamphlets, paper boxes 12 in. long by 8 in. wide and $3\frac{1}{2}$ in. deep are also used. These are kept on ordinary shelves, and should be numbered and the pamphlets indexed in the card list. Of course, a library catalogue could also be included among the cards if desirable, and sub-alphabetical lists can be added wherever desirable. Thus addresses of various people are kept under the title of "Addresses," but the names are arranged alphabetically in the single space devoted to them.

In fact, this system is suited to the needs of any occupation or profession, and to any business or office, and may be universally applied, and is equally well suited for keeping a housewife's domestic receipts, a railroad engineer's notes and data, or a prime minister's memoranda on diplomatic affairs. It has the advantage of being suited to the smallest as well as the greatest affairs. A boy or a student may begin it with a cigar-box and a few pieces of stiff paper cut to the size of a postal card, or the affairs of a great railroad, or the accumulated affairs of a life-time may be recorded in this way.

It seems, in fact, as though the time has come when it will be necessary to adopt some great and comprehensive system of indexing knowledge to make it available. The bulk of it is now so great and increasing with such fearful rapidity that it is beyond the power of a single mind or individual to make use even of that relating to a narrow specialty. Perhaps few realize how much knowledge passes into oblivion. Reference is not made to what was known in ancient times, but if any person will make a thorough search, say in a great library, for information concerning almost any subject he will constantly be surprised by discoveries, in literature not older than many living people, as unexpected as the finding of buried treasures.

It is easy to grow enthusiastic over this system. Its convenience is so great, the amount of work required is so little, that a person with even a moderate amount of time and industry will be able to do a great deal with it. A few cards can be carried in a pocket-book, and notes made at any time or place. To record such memoranda all that is needed is to drop the card into its proper place. It is then indexed, and will be preserved so that it can be found at any time.

If this system came into general use, what a heritage many persons would leave to those who succeed them. Instead of what may be called an incoherent mass of material, the memoranda they leave behind would be classified and indorsed so that it could be used as well by their successors.

Another scheme suggests itself. What is there to prevent two persons from agreeing to duplicate and exchange their notes on cards? The amount of data thus accumulated by each, supposing that they were equally industrious, would thus be doubled. If two persons could do this, why not twenty, two hundred, or two thousand, which brings us face to face with an organization of persons interested in the same subjects and who would agree to forward all useful notes, memoranda, etc., to a central repository, there to be carefully edited, then printed on cards, and distributed among the members. Conceive of the usefulness of such an organization, if it employed a competent person to summarize the useful information contained in the current technical literature of the day into somewhat the form in which it is given in pocket-books, then have it printed on suitable cards, and distributed among members ready to be classified and indexed with other useful information of a like kind.

This system of keeping notes, memoranda, etc., has been described here at length, on account of its great usefulness to railroad men, especially those engaged in the mechanical and other engineering departments.

Pennsylvania Railroad Earnings and Expenses.

Pennsylvania Railroad earnings in February on all lines east of Pittsburgh and Erie were this year \$405,465 (12½ per cent.) more than last year, the working expenses were \$148,392 (6½ per cent.) more and the net earnings \$257,073 (23½ per cent.) more. The increase in gross earnings is the smallest since July, but the increase in net earnings

was greater than in any month of last year, except August, September and October.

For eleven successive years the earnings and expenses have been:

Year.	Gross earnings.	Expenses.	Net earnings.
1873.....	\$2,685,295	\$2,145,165	\$540,130
1874.....	2,517,080	1,716,881	800,199
1875.....	2,166,815	1,432,163	734,652
1876.....	2,345,792	1,881,194	464,598
1877.....	2,165,090	1,461,646	703,444
1878.....	2,169,900	1,418,009	751,891
1879.....	2,538,039	1,365,053	1,172,987
1880.....	2,944,575	1,712,394	1,232,182
1881.....	3,095,594	1,937,510	1,158,084
1882.....	3,306,733	2,227,129	1,079,604
1883.....	3,712,195	2,375,321	1,336,874

Thus, the increase of 12½ per cent. in gross earnings this year is an increase over the largest ever made in February. Compared with 1881 the increase is 30 per cent., compared with 1879, 46 per cent.; and compared with 1878, it is 71 per cent. Scarcely any Western road in new and undeveloped country can show such a rate of growth as this, which has been made with but a trifling increase in mileage.

The working expenses are also larger than ever before—22 per cent. more than in 1881, 39 per cent. more than in 1880, and 74 per cent. more than in 1879. The net earnings last year, in February, were the smallest for four years; and this year, though they are 23½ per cent. more than last year, they are but 15½ per cent. more than in 1881, 8½ per cent. more than in 1880, and 14 per cent. more than in 1879.

Earnings in February are usually light. This year they are smaller than in any previous month since February of last year. The expenses are also the smallest since May of last year. The shortness of the month has much to do with this, however.

The net earnings of the lines west of Pittsburgh and Erie during February were \$164,776 less than the liabilities for interest, rentals, etc., while in January they netted a profit of \$174,981. Last year, in February, the loss on these lines (as now reported) was \$14,701. It was then reported to be \$121,306.

For the two months ending with February, for 11 successive years, the earnings and expenses of the lines east of Pittsburgh and Erie have been:

Year.	Gross earnings.	Expenses.	Net earnings.
1873.....	\$3,439,579	\$3,339,817	\$1,099,762
1874.....	3,375,145	3,454,370	1,920,775
1875.....	4,457,154	3,082,930	1,374,224
1876.....	4,793,477	3,562,864	1,230,613
1877.....	4,549,265	3,117,080	1,431,576
1878.....	4,538,200	2,936,107	1,602,093
1879.....	5,081,463	2,888,945	2,192,518
1880.....	6,028,126	3,429,646	2,598,480
1881.....	6,284,909	3,919,804	2,364,945
1882.....	6,680,051	4,526,184	2,153,867
1883.....	7,641,552	4,833,820	2,807,732

Thus gross and net earnings and working expenses all have been larger this year than ever before. Compared with last year there is an increase of \$961,501 (14.4 per cent.) in gross earnings, of \$307,636 (6.8 per cent.) in expenses, and of \$653,865 (30½ per cent.) in net earnings. This increase in profits is equivalent to a little more than ¼ per cent. on the company's stock.

There has never before been such an increase in this company's earnings, except from 1879 to 1880, when it was nearly the same. In 1879 the earnings for the two months were the largest for five years. Yet the increase since 1879 has been 50 per cent. in gross earnings, 67½ per cent. in expenses, and 28 per cent. in net earnings.

The increase in expenses, it is worth noticing, is smaller than before since 1879, though the increase in earnings is larger. The expenses were 67½ per cent. of the earnings last year and only 63½ per cent. this year. So far as through trunk line traffic is concerned, this year has been much the more favorable, the heavy business last year having been carried at rates so low that the expenses must have been 100 per cent. or more on much of it; but the other traffic of the road is so much the more important that we may not ascribe all the improvement to this. Last year the increased earnings of \$395,242 over 1881 was made with an increase of \$606,320 in expenses; this year, the increase of \$961,501 over 1882 was made with an increase of but \$307,636 in expenses. Probably average rates were somewhat better than last year, but probably also the condition of the property is now such that additions to traffic require but comparatively small increases in working expenses. Much depends upon the nature of the traffic which has grown—whether it is that which pays the highest or that which pays the lowest rates.

The lines west of Pittsburgh and Erie for the ten months show a surplus over all liabilities of the trifling sum of \$10,205, against a deficit of \$57,449 last year, a surplus of \$546,229 in 1881, a surplus of \$422,014 in 1880, and a surplus of \$125,897 in 1879.

The Western trunk lines further north have done so well in January and February, and so very much better than last year, that a better result might have been expected. The Pennsylvania lines include, however, some of the roads which suffered most by the Ohio River floods, and as a surplus of \$174,981 was reported in January, which was changed to a deficit of \$164,776 in February, the month of the floods, the whole of falling off in the latter month may perhaps be attributed to this cause. If so we shall probably see a notable gain in March.

Record of New Railroad Construction.

This number of the *Railroad Gazette* contains information of the laying of track on new railroads as follows:

Atlantic & Pacific.—Track laid to a point sixty-four miles west of Yampai, Ar., an extension of 49 miles.

Central Iowa.—The *Peoria & Farmington* Division is extended from Monmouth, Ill., west by north to Keithsburg, 26 miles.

Indiana, Illinois & Iowa.—Extended from Sugar Creek, Ind., east to Shelby, 6 miles.

Jacksonville & St. Augustine.—Track laid from Jacksonville, Fla., south by east 20 miles. Gauge, 3 ft.

St. Louis, Iron Mountain & Southern.—The *White River Branch* is extended westward to Batesville, Ark., 14 miles.

St. Louis & San Francisco.—The *White River Branch* is extended from Ozark, Mo., southward to Sparta, 12 miles.

This is a total of 127 miles, making 521 miles thus far reported for 1883, against 1,180 miles reported at the corresponding time in 1882, 541 miles in 1881, 975 miles in 1880, 298 miles in 1879, 226 miles in 1878 and 165 miles in 1877. The mileage reported thus far this year is less than in any year since 1879.

ERIE EARNINGS AND EXPENSES are now reported for January and the first four months of the company's fiscal year. In January there was an increase of \$205,872 (15.6 per cent.) in gross earnings, an increase of \$84,078 (7.4 per cent.) in working expenses, and an increase of \$121,794 (66½ per cent.) in net earnings. The enormous percentage of increase in net earnings might lead one to think that the profits were exceptionally large last January. This was not the case, however. They were then not half as large as in November last. The percentage of increase was so large because the net earnings were extraordinarily small in January last year—smaller than in any other month that has been reported, though traffic was unusually large then. For each of the four months of the fiscal year the gross and net earnings this year and last have been:

	Gross earnings.	Expenses.	Net earnings.
1882-83.	1881-82.	1882-83.	1881-82.
October.....	\$1,819,010	\$1,814,866	\$643,329
November.....	1,818,824	1,715,408	757,206
December.....	1,691,404	1,571,208	441,739
January.....	1,624,569	1,318,096	304,576

January is always a month of light earnings on this road, and there is no particular significance in the decrease in gross and net earnings from the fall months, and as we shall see later the gross earnings this year were larger than in any previous January. The expenses were exceptionally high then, however, exceeded only in December last, and in December, 1880. Last year, it will be seen, the net earnings in January were \$199,000 less than in December, and \$457,000 less than in November; this year they were \$137,000 less than in December and \$433,000 less than in November. For six successive years the gross and net earnings and working expenses in January have been:

Year.	Gross earnings.	Expenses.	Net earnings.
1877.....	\$1,304,011	\$959,793	\$344,225
1878.....	1,147,173	960,031	187,142
1879.....	1,296,381	946,565	349,816
1880.....	1,443,437	1,137,988	305,449
1881.....	1,318,990	1,136,214	182,782
1882.....	1,524,809	1,220,293	304,576

Thus, as we have said, the gross earnings were greater this year than ever before, though but 5½ per cent. more than in 1881. The expenses were a little larger than in the last two years. The net earnings were 66½ per cent. more than last year, and 63 per cent. more than in 1879, but slightly less than in 1881, 13 per cent. less than in 1880, and 11½ per cent. less than in 1878. It was thus about an average January, so far as profits are concerned.

In this month the Pennsylvania Railroad had an increase of 37 per cent. in net earnings over 1882, but also an increase over any previous years, 68 per cent. over 1878, and 7½ per cent. over 1880, when the Erie's net earnings were larger than this year.

For the four months of the fiscal year ending with January the earnings and expenditures have been:

Year.	Gross earnings.	Expenses.	Net earnings.
1877-78.....	\$5,875,437	\$3,857,046	\$2,018,391
1878-79.....	5,207,851	3,577,415	1,630,436
1879-80.....	5,924,157	3,950,651	1,973,503
1880-81.....	6,867,472	4,432,732	2,434,740
1881-82.....	6,420,540	4,591,114	1,829,425
1882-83.....	6,854,100	4,707,236	2,146,864

Compared with last year there is an increase of \$433,566 (6½ per cent.) in gross earnings; of \$116,141 (2½ per cent.) in working expenses; and of \$317,424 (17½ per cent.) in net earnings. The gross earnings were exceeded only in 1880, and then but slightly. The working expenses were larger than ever before, and the net earnings were exceeded only in 1880-81, but then by \$287,890, or 13.4 per cent.

The months following January, until July or August, were probably exceptionally bad last year. For the eight months to the end of the fiscal year (February to September inclusive) the earnings and expenses were:

	1882.	1881.	Inc. or Dec.	P. c.
Gross earn.....	\$13,555,234	\$13,848,133	D. \$292,899	2.1
Expenses.....	8,490,979	8,825,498	D. 336,519	3.7
Net earn.....	\$5,058,255	\$5,024,635	I. \$33,620	0.6

There was probably a considerable increase in gross earnings in August and September and some perhaps in July, and if so the decrease in the other five or six months was so much larger than that for the eight months. A decrease in net earnings was prevented by a large decrease in expenses which will hardly be possible in a second year. We may therefore expect for the months from January to harvest this year a large increase in gross earnings and a very considerable increase in expenses. The average expenses per month for the last eight months of the year were \$1,062,122 last year and \$1,102,937 in 1881. For the first four months of this year they have been \$1,176,814.

The competition of the new Lackawanna road will doubtless be felt much more hereafter than heretofore, at least as regards through traffic. It will tend to decrease the earnings, though how much we can only conjecture. The Erie has never carried the Lackawanna coal, which will doubtless form the larger part of the new road's Buffalo traffic the first year.

THE MICHIGAN CENTRAL, it is reported, will not declare a dividend for the first quarter of the year, though it is doubtful if there has been a quarter in its recent history when it

has earned a much larger profit, and the passing of the dividend when one was expected will doubtless be considered by many as pretty good evidence that none was earned, and will have an unfavorable effect on the price of the stock. But by the contract with the Canada Southern the latter company is entitled to its third of the surplus of net earnings over fixed charges on the first of January and July. Thus, however large the profits in the first quarter, it cannot be known how large a part of them will be at the disposal of the Michigan Central company until after the expiration of the second quarter. For instance, the surplus for the first quarter might be \$600,000, and the Michigan Central's share of this would be \$400,000, which would pay 2 per cent. on the stock and leave a small margin. But then it would not be impossible that instead of a surplus in the second quarter there would be a deficit, bringing down the profits of the half-year to \$450,000. Of this the Canada Southern would be entitled to \$150,000, but if the Michigan Central had paid a 2 per cent. dividend in the first quarter, there would not be money enough in the treasury to pay the Canada Southern its share. In fact, the only safe way is for the two companies to divide at the same time, and by the contract the Canada Southern receives money that it can divide only half-yearly.

The original sin in this matter was in resolving at Christmas in 1880 that dividends would be made quarterly thereafter. At that time the company had had profits to divide for little more than a year, and to "resolve" to divide quarterly thereafter was rather presumptuous. Probably it was quite generally regarded by stockholders as an expression on the part of the board that the company would always have something to divide quarterly thereafter, and probably as much as 2 per cent., and this may have had something to do with the rise of the stock to 130 shortly thereafter. But this is exactly the reason why the resolution should not have been passed. Directors should hold forth no such expectations unless they have much better reason for faith in the future than well-informed men should have had for the Michigan Central in 1880. The very first quarter after the resolution was passed the dividend was reduced to 1½ per cent., and the second quarter to 1 per cent., after which no dividend was paid for five successive quarters. The company must now be doing extremely well again, and something remarkable must happen if it does not earn at least as much as 4 per cent. for its stockholders in the first half of this year.

It is remarkable, by the way, that the market price of Michigan Central and Canada Southern stock should bear such a proportion to each other. The relative amounts of profits to the stockholders of the two companies are absolutely fixed. For every dollar that the Canada Southern Company gets for its stockholders the Michigan Central gets two. The Canada Southern stock is 15 millions, the Michigan Central almost exactly one-quarter more. The amount available for dividends per share of stock therefore will be as 1 on the Canada Southern to 2 + 1½ on the Michigan Central, or as 1 to 1.6. That is, the Michigan Central will have 60 per cent. more per share than the Canada Southern, be the profits large or small, for the next 20 years. When there is enough for 5 per cent. on the Canada Southern there will be enough for 8 on the Michigan Central; if the profits permit dividing \$6 per share on the Canada Southern, they will be enough for \$9.60 on the Michigan Central. We should thus expect the Michigan Central stock always to sell for 60 per cent. more than the Canada Southern. But actually, Michigan Central usually sells for but 40 per cent. more than Canada Southern.

We do not mean to say that the dividends must always be in the proportion of 1.6 to 1, but the amounts per share available for dividend. Each company can do as it pleases with its share of the profits—may divide it all, or pay out part or the whole of it for construction. But as any payment of profits for construction will benefit the other company, we may assume that the whole of the profits will be divided.

RAIL EXPORTS TO THE UNITED STATES continue very light. From Great Britain in February the exports to this country were the smallest since July, 1879, after which they first began to revive. They were but 4,093 tons in February, and for the last four months they have been but 21,569 tons, while the average for a single month in the first half of 1882 was 20,467 tons, in the year 1881, 24,178, and in 1880, 18,273 tons. As at the same time three or four of the Bessemer works in this country are closed, and still the price of rails does not advance, but on the contrary is lower rather (there are reports of sales recently at \$38), the inference is justified that the demand for rails is much lighter than last year. It perhaps may be thought superfluous to make such an inference; but there have been intimations of late that about as much railroad would be built this year as last. Doubtless there are projects enough on hand to supply the rail mills of the world with all the orders they can fill, and if they would only take their pay in bonds of new companies whose road is yet to be built, they would have no trouble in getting them. The difficulty is in getting capital for the new enterprises. Investors of all kinds are very shy of them.

We shall, nevertheless, doubtless build this year what in any other country would be an enormous amount of new railroad—how much will depend chiefly upon the disposition of investors, which in turn will depend somewhat on the returns made by the new roads built of late years. The track laid so far this year is 56 per cent. less than last year, 4 per cent. less than in 1881, and 46 per cent. less than in 1880. The winter has been more unfavorable for building than last year, but less unfavorable than in 1881. If we

have heavy crops and the movement of population to the new country in the Northwest is very great this spring, the promoters of new schemes will be greatly encouraged and will try hard to raise the means needed to go to work in the fall. In most cases it is useless for them to try now, though there is certainly a better disposition now than there has been for some months previous.

PIG-IRON PRODUCTION, which has grown to enormous proportions of late years, is an important industry in comparatively few states, but tends to grow faster in some others than in the states that are now the principal producers. The four states New York, New Jersey, Pennsylvania and Ohio produce nearly three-fourths of the whole; Pennsylvania and Ohio, more than three-fifths of the whole. These two states may thus properly be held to be the principal seat of the iron-smelting industry. The total production and the production of the four states named for three years has been, in tons of 2,000 lbs.:

	1880.	1881.	1882.
United States.....	4,293,414	4,641,564	5,178,120
N. Y., N. J., Pa. and O.....	3,322,738	3,432,523	3,741,117
P. c. in last.....	77.4	73.9	72.2

Nearly all the increase has been in Pennsylvania, whose production was 366,135 tons (14.3 per cent.) more in 1882 than in 1880, while that of the other three states of the group was 52,244 tons, or 4.2 per cent. more. In Ohio, which is next to Pennsylvania in amount of production, there was a decrease from 1881 to 1882. The increase in the whole United States from 1880 to 1882 was 882,706 tons, nearly one-half of which was in the four states above mentioned.

The group next in importance is formed by the four states Michigan, Illinois, Wisconsin and Missouri. Their production for the three years has been:

	1880.	1881.	1882.
Tons.....	507,377	650,652	770,105
P. c. of total.....	11.8	14.0	14.9

These states appear to compete more with Ohio than with Pennsylvania. Together they last year for the first time produced more than Ohio, whose production has been:

	1880.	1881.	1882.
Tons.....	674,307	710,346	698,900
P. c. of total.....	15.7	15.3	13.5

Of the four Western states named, Illinois is the chief producer, followed by Michigan. Missouri shows little growth; Wisconsin none. Illinois last year produced 360,407 tons, or 7 per cent. of the total in the United States, and stood fourth in the list of producing states, surpassed only by New York, Ohio and Pennsylvania. Its increase since 1880 has been 209,851 tons, or 140 per cent. No other state has shown such an increase. Yet a large proportion of the fuel and all the ore used is brought to Illinois from other states.

In the South production is small, but considerable progress has been made. In all the states south of the Potomac and the Ohio and east of the Mississippi the production has been:

	1880.	1881.	1882.
Tons.....	333,361	419,764	521,630
Per cent. of total.....	7.7	9.0	10.1

The furnaces are very much scattered here, but last year about 161,000 tons were produced in Virginia and West Virginia, and 250,000 in Alabama and Tennessee; there is very little growth in West Virginia; an increase of 190 per cent. since 1880, but of only 5 per cent. since 1881 in Virginia (which produces more than West Virginia). In Alabama and Tennessee there is marked growth since 1880, 46 per cent. in Alabama and 94 per cent. in Tennessee. Tennessee produces more than any other Southern state, but its total production last year was but 2.7 per cent. of the total United States production. Colorado began to produce first in 1881. Last year its production was 23,718 tons; it is more than that of all other states west of the Mississippi together, Missouri excepted.

THE WABASH, ST. LOUIS & PACIFIC TRAFFIC has shown a very satisfactory increase in passengers since 1880 but a very unsatisfactory one in freight. The passenger traffic last year was 21 per cent. more than in 1881 and 70 per cent. more than in 1880. But in freight traffic there was an increase of less than 9 per cent. over 1881 and 22 per cent. over 1880—the mileage worked having increased more than 40 per cent. since 1880. This road, though its lines are so far west, a very large proportion being west of the Mississippi, and the amount of traffic on them comparatively light, has to accept rates but little higher than those of the trunk lines, the average last year being 0.951 cent per ton and 2.37 cents per passenger per mile. This is the primary cause of its unprofitableness, for it is very cheaply worked for a road situated like it, the average cost last year being reported as 0.658 cent per ton and 1.64 cents per passenger mile. The expenses on the New York Central last year were 0.60 cent per ton-mile, and the Central has twice as much freight traffic on its 1,000 miles of road as the Wabash on its 3,200. On the through line of the Wabash from Toledo to St. Louis rates were artificially low in the first half of last year, but this can be only a small part of the traffic of the company. The trouble is that the lines of the company nearly everywhere this side of the Mississippi are so situated that the trunk-line through rates—which when well maintained at the highest point are the lowest freight rates in the world—limit the rates attainable upon the local as well as the through traffic. The rates may be higher when trunk-line rates are maintained, but when highest they will still be low. The railroads which carry to Chicago get much better rates, and perhaps the Wabash is most likely to increase its profits by carrying more to Chicago and less to Toledo. But this depends chiefly on the lake rates. Any considerable advance in the Wabash rates will probably always be impossible. The way to larger profits must be found chiefly through an increase in traffic and a reduction of expenses.

THE FIRST YEAR OF THE PRESENT CHICAGO POOL expired March 13 last. At that time the five roads had carried 2,392,593 tons of freight. The tons which each were entitled to under the pool and the tons which they each actually carried were so nearly alike that the balances over and short at the end of the year were:

	Over.	Short.
Chicago & Grand Trunk.....	8,648 tons.	
Michigan Central.....	53,650 "	
Pitts., Cin. & St. Louis.....	1,864 "	
Lake Shore.....		28,311 tons.
Fort Wayne.....		24,531 "
Baltimore & Ohio.....		11,320 "
	64,162 tons.	64,162 tons.

The Michigan Central, which is farthest from its proportion, has after all carried but 2½ per cent. more of the traffic than its share, or 26½ per cent. instead of 24½. It and the Lake Shore will doubtless be left to adjust their own differences, and these two companies together are 25,339 tons out of their proportion, having carried during the year 1,113,969 tons, instead of 1,088,630, and 46.56 per cent. of the whole, instead of 45.5 per cent. The Fort Wayne is short about 1 per cent., and the Baltimore & Ohio about ½ per cent., while the Chicago & Grand Trunk is over nearly ½ per cent. The earnings of the Michigan Central, from what it has carried above its share, if all carried at the highest rates of the year, would be about \$107,000. Rates such as prevailed after June in 1881 would cause it to lose as much as this in three weeks. While there have been at times some irregularities since the agreement was made last year, they have been insignificant in their effect, so that the regular rates are those which have been received on nearly all the freight. Rates have been low throughout the year: circumstances prevented their being otherwise, but they have always yielded some profit, and have been a vast improvement on the 15, 12½ and 10 cent rates that prevailed during the railroad war.

THE CINCINNATI SOUTHERN RAILWAY, which was built by the city of Cincinnati solely to increase its own commerce with the South, and which is still owned by the city, has recently made arrangements with the Louisville & Nashville, by which it will run freight and passenger cars through to and from Louisville as well as Cincinnati, so that it may be said that the railroad which Cincinnati built for itself is now just as much at the service of Louisville. Probably if anything of the kind had been proposed at the time Cincinnati was building the road, it would have been regarded as altogether out of the question; and yet it was all the time almost inevitable. Every railroad finds it necessary to carry all the traffic it can get which will give it a profit. The Pennsylvania Railroad cannot afford to carry for Philadelphia alone, nor the New York Central for New York. They could not if they were worked solely in the interest of these cities. If they did it would increase the cost of the transportation done for them.

It does not follow, however, that Cincinnati has gained nothing by the Cincinnati Southern. It has gained not only the traffic which that road brings it, but the complete use of the vast system of the Louisville & Nashville, which may be worth a great deal more. When there was no direct route from Cincinnati to the South, the rates on freights reaching it by way of Louisville naturally were higher than the rates to Louisville. But with the Cincinnati Southern forming a line to Chattanooga only 335 miles long, it was in position to demand something like equality in rates, for points as far south and east as Chattanooga, with Louisville, which is 336 miles from Chattanooga; and such equality, or a nearer approach to it than formerly, it has attained, enabling it, in a large and important district, to compete for business on equal terms with Louisville.

CHICAGO THROUGH SHIPMENTS EASTWARD for the week ending March 21 have been for four successive years:

	1880.	1881.	1882.	1883.
Tons.....	75,430	55,486	38,646	69,368

The shipments this year were thus 80 per cent. more than last year, 25 per cent. more than in 1881, but 8 per cent. less than in 1880.

Of the shipments this year 14.5 per cent. was carried by the Chicago & Grand Trunk, 26.4 by the Michigan Central, 17.9 by the Lake Shore, 23.5 by the Fort Wayne, 13 by the Pan-handle, and 4.7 per cent. by the Baltimore & Ohio.

For seven successive weeks the shipments have been, in tons:

	Week to	Feb. 7.	Feb. 14.	Feb. 21.	Feb. 28.	Mar. 7.	Mar. 14.	Mar. 21.
		43,388	58,140	61,533	69,385	72,051	69,696	69,368

The shipments keep up wonderfully well, and though they have not yet been so large in any one week as in either of the last two weeks of March, 1880, they were so much larger in the first two weeks that it is possible that the shipments of the last ten days of the month will bring up the March shipments this year to as high figures as in 1880, when they were about 320,000 tons, and larger than in any other month except January, 1882, when they were a very little more. In 1880 the rate was 5 cents per 100 lbs. higher than this year. Besides these reported shipments a considerable quantity has gone by the New York, Chicago & St. Louis, so that the total Chicago shipments have probably been a little larger than in any previous month.

From the week ending March 24 the eastward shipments, through and local, of flour, grain and provisions reported at Chicago were 70,708 tons, against 28,891 tons in the corresponding week of last year, and 67,509 tons in the previous week of this year. Of these shipments 4,298 tons (all grain) went by the New York, Chicago & St. Louis, whose business is not included in the pool.

FREE CARRIAGE OF SEED CORN was recently offered by the Rock Island road, in order to insure a plentiful supply of seed corn to the farmers in Iowa, where much of the corn last year was so imperfectly ripened that it will not grow. This was in the interest of the road as well as the farmers as there is no one thing so good for it as a good crop of corn. There is plenty of good seed corn in Nebraska, and except that it is not common for Iowa way stations to import corn it should not be difficult to get a supply. It appeared, however, that the local dealers who imported the seed corn were getting the whole benefit of the free carriage, and charging the farmers very high prices for the corn. To guard against this the Chicago & Northwestern makes it a condition of free carriage that the dealers shall sell the corn for not more than 10 per cent. more than they pay for it. Luckily the cost of seed, even if high prices are paid, will not be very great, as a bushel is enough for eight acres or so, very unlike wheat, where a bushel and a half or more is required, forming more than 10 per cent. of the average crop.

This effort of the Iowa roads to encourage a large production is in many respects similar to the arrangements recently made by the Erie road to co-operate with the milk-producers on its line to secure a good market for their milk. It is bread sown upon the waters, sure to come back after many days.

THE FREIGHT EARNINGS BY LINE CARS on the Cleveland, Columbus, Cincinnati & Indianapolis Railway were 54 per cent. of its total through freight earnings in 1882, against 69 per cent. in 1881, and 73 per cent. in 1880. The withdrawal of the Erie lines last year caused the great decrease then. Yet it seems not to have greatly affected the total through freight traffic. There was to be sure a decrease of \$207,431 in the earnings by lines, but in the total earnings from through freight there was an increase of \$148,318, or 7½ per cent.

The proportion of west-bound through freight has been increasing lately on this road, as on some other through lines. From 1873 to 1880 it rose from 16½ to 29½ per cent. of the whole, and in four of these years it was 80 per cent. or more. In the last two years it has been 83 per cent. This has been partly due to a falling-off in the shipments of farm produce, doubtless, but it is also partly due to considerable increase in the movement of freight to the West. The east-bound movement was largest in 1879; but the west-bound was 16½ per cent. larger in 1881, and 12½ per cent. larger in 1882 than in that year.

NORTHWESTERN RAILROAD EARNINGS show a further improvement in the third week of March, contrasting strongly with the losses in January and February, and indicating that these losses were due to the weather, which did not so much destroy as postpone traffic. In this third week of March the Chicago, Milwaukee & St. Paul gained \$135,755 (38 per cent.), the Chicago & Northwestern \$101,900 (27 per cent.), the St. Paul & Omaha \$13,500 (15 per cent.), the Northern Pacific \$64,850 (77 per cent.), the St. Paul & Manitoba \$58,000 (46 per cent.). Besides a heavy crop movement, the larger because it was somewhat delayed earlier in the year, these roads are now beginning to feel the movement of emigrants and their supplies. Few data as to the extent of this movement are at present attainable, but such as we have seen indicate a very heavy movement. A great many, for instance, are going from Northern Illinois to the southern half of Dakota. A movement of this kind is of the highest promise to the roads named and to several others. It occurs chiefly in the spring, and the travel for two or three months, therefore, largely determines what the year's growth of the new country shall be.

PROVISION EXPORTS continue very light. Last year they were smaller than before for several years, and this year for the four months of the packing year, from Nov. 1 to Feb. 28, the exports of fresh and salt beef and tallow were 3 per cent. less than last year, and of hog products 16½ per cent. less, and in spite of higher prices the value of the exported products was 9 per cent. less this year. In February, the last month of the four, the comparison is not so unfavorable, the decrease in hog products being but 5½ per cent., while there was an increase of 15½ per cent. in beef and tallow, and in value there was an increase of 4½ per cent. A considerable increase in beef and tallow is possible, but not for many months in hog products.

Sickness and Mortality of Railroad Employees.

Dr. Harald Westergaard, of Copenhagen, in a treatise on the Theory of Mortality and Morbidity—on the death rate and the amount and kinds of sickness in different classes of population and under different circumstances—a work published last year and awarded a prize by the University of Copenhagen, gives a chapter to men engaged in railroad service, which is founded on the various statistics and treatises on the subject which have been plentifully published in Europe, though the statistics still lack much of completeness.

For England he cites some statistics showing that of railroad employes of different ages the mortality was 21 per cent. greater than of an equal number of the population as a whole. At the age of 25 the railroad man, however, was less likely to die than the average person of his age; but at greater ages the mortality of railroad men was much the greater. Thus the number of deaths per 100 persons and the average number of days each person was sick at different ages were:

	Age	25.	30.	40.	50.	60.
Deaths per 100:						
Railroad men.....	0.55	1.10	1.72	2.24	5.49	
Whole population.....	0.71	0.77	1.03	1.50	2.61	
Days of sickness per individual:						
Railroad men.....	9.10	9.77	10.50	15.00	11.84	
Whole population.....	6.83	6.91	8.21	11.49	18.73	

Thus the railroad man is sick more than the average man, as well as more likely to die.

In Germany there have been statistics of mortality for different classes of railroad men from 1870 to 1878, which show that in the whole body of railroad men the deaths were 20 per cent. less than for the average population, and the deaths of trainmen 9½ per cent. less, and this is true of men of all ages.

This calculation, however, leaves out of account the invalid class. Taking all the members of the railroad insurance societies, both active and invalid, the average death rate appears to differ little from English experience, which is higher than that of the whole people.

The number of cases of sickness among the German railroad employes is large, and the average number of days of sickness per employe is also pretty large—being from different ages:

Age	Under 20	20	30	40	50	60	70
Days sickness	4.8	7.7	7.8	10.2	14.0	20.6	28.7

The mortality of the train-men is, however, 13 per cent. greater than that of the whole body of railroad men, and the number of train-men becoming invalids is now less than 56 per cent. greater than the average, their average number of days of sickness 57 per cent. greater, and the number of cases of sickness among them 73 per cent. greater, their illness, on the average, being of shorter duration than that of other men. In no other calling are the cases of sickness so frequent.

In a given number of employes who by the experience of the whole population should have had 40,922 cases of sickness, there were 70,939 cases, and they were sick 852,426 days, whereas by the ordinary experience they should have been sick but 542,714 days; 590 of them became invalids, instead of 332, as the average experience of the whole people showed.

Comparing train-men with the whole class of railroad employes, the number of days sickness yearly at different ages were:

	20	30	40	50	60 to 70
Train-men	11.0	12.6	16.3	24.3	36.5
All employes	7.8	7.8	10.2	14.0	20.6

Thus the train-man on the average is sick more than 50 per cent. more than his fellows in railroad service.

The statistics for railroad employes below are from the records of German roads from 1870 to 1876:

Age.	TRAIN-MEN.		ALL RAILROAD EMPLOYES.		EXPERIENCE OF MORTALITY AND SOCIETIES.	
	Days ill for every 100 men.	Cases of illness per 100 men.	Days ill for every 100 men.	Cases of illness per 100 men.	Days ill for every 1,000 members.	Number ill for 1,000 members.
20	11.0	120.7	7.7	72.8	5.30	26.5
30	12.6	110.5	7.8	63.5	5.95	25.3
40	16.3	115.1	10.2	66.6	7.80	26.9
50	24.3	138.0	14.0	70.9	10.09	28.2
60 to 70	36.5	128.0	20.6	73.3	13.78	31.4

Taking the experience of 1877-8, the death rate of conductors, brakemen, baggagemen, etc., is above the average expectation 22 per cent., with a sickness rate yet more unfavorable. Of firemen and engineers the mortality is very much less—not above the average; but then there is as much, if not more, sickness among them.

The following tables give the actual number of deaths, of cases of sickness, and of days of sickness among three classes of railroad men in Germany in 1877 and 1878, each class compared with the experience of all in order to show its proportionate rate of sickness and death. Cases of disability include those permanently disabled, worn out, etc., and form a class by themselves, whose mortality follows the same general order as that of the active class—namely, greater among pensioned station-men than among pensioned track-men and among pensioned train-men than among pensioned locomotive men, the death rate being especially large among the younger men.

Deaths of Railroad Men in Germany.

ROADMEN.													
Age.	Deaths.		Cases of illness.		Days of sickness.		Cases of disability.		Av. ex.	Actual.	per cent.		
	Actual.	Av. ex.	Actual.	per cent.	Actual.	per cent.	Actual.	per cent.					
20.....	312	39	1,020	1,040	31,602	45,135	24	17	136	124	9,329	5,391	
30.....	312	592	14,420	17,169	185,987	219,203	93	142	68	64	3,174	1,749	
40.....	341	385	9,853	10,838	124,240	174,959	277	279	43	37	1,182	615	
50.....	255	274	5,879	6,006	120,228	139,304	57	439	59	18	1,337	42,631	
60.....	18	117	1,337	1,253	42,631	39,631	408	877	70	2	14	5	
70.....	18	15	89	77	3,451	3,451	55	61					
	1,056	1,282	34,178	39,140	528,305	611,983	1,395	1,355					
CONDUCTORS, BRAKEMEN AND BAGGAGEMEN.													
20.....	41	42	3,322	1,030	29,780	21,569	11	8	136	124	9,329	5,391	
30.....	212	164	11,321	7,238	134,380	92,251	106	60	68	64	3,174	1,749	
40.....	123	140	6,455	3,937	53,368	61,138	137	90	43	37	1,182	615	
50.....	72	72	65	3,308	1,364	41,978	28,394	115	118	59	18	1,337	42,631
60.....	28	17	256	158	7,722	3,451	61	65	70	2	14	5	
70.....	2	14	2	5	228	220	7	4					
	528	429	23,731	14,575	307,714	210,508	437	340					
ENGINEERS AND FIREMEN.													
20.....	55	68	5,721	3,269	59,325	36,524	18	13	136	124	9,329	5,391	
30.....	128	124	9,329	5,391	114,406	68,715	86	46	68	64	3,174	1,749	
40.....	68	64	3,174	1,749	55,075	28,054	65	47	43	37	1,182	615	
50.....	43	37	1,182	615	27,714	13,126	61	65	59	18	1,337	42,631	
60.....	7	9	84	47	3,677	1,403	40	28	70	2	14	5	
70.....	2	14	5	24	408	110	7	4					
	260	312	10,433	11,068	259,651	148,066	307	207					

It will be seen that the class of train-men including conductors, baggagemen and brakemen suffers more than any other class both by sickness and by death. Their number of

sick days is 40 per cent. above the average, the death rate 23 per cent. above the average, while that of engineers and firemen is below the average. Enginemen and firemen have over 75 per cent. of sick days above the average, and about one-third more of them than of the average of employes are placed on the pension list. The conductors, baggagemen and brakemen contribute about the same proportion to the pension list, but more in the younger years of life. The road-man's occupation does not shorten his life, and he has only the average number of cases of disability in his class, but about 10 per cent. more than the average of sick days. His average of life is above the average of all railroad employes.

General experience shows a probability of longer life but more frequent illness for those who are exposed to the elements in all weathers. The ill health of the enginemen and fireman is due to the motion of the engine, slight injuries to the eyes by cinders, etc., and to exposure. It is evident that the injurious effects of railroad life in Germany are felt mainly by conductors, baggagemen and brakemen.

Foreign Railroad Notes.

A German statistician has been studying the results of the competition of the railroads and the Rhine, and finds that the river is gaining. Taking as an example a river town which is also a railroad centre, it appears that of the receipts and shipments of twenty-five leading articles 60½ per cent. was carried by the railroads in 1875, but only 52½ per cent. in 1881. The river leads in some freights which here we should expect the railroads to monopolize almost. For instance, it carried 71 per cent. of the coffee, 50 per cent. of the spirits, substantially the whole of the wooden-ware, 97½ per cent. of the salt and 93 per cent. of the leather.

The oldest German railroad is the Nuremberg & Fürth, 2½ miles long, which was opened Dec. 7, 1835. The next was the Leipzig & Dresden, part of which was opened in 1827, but which was not completed (71 miles) until 1839. At the end of 1840 there were only 360 miles of railroad in Germany. There were then 2,819 miles in the United States. The progress in the two countries thence at intervals of five or ten years has been:

	1840.	1845.	1850.	1860.	1870.	1880.
Germany	360	1,439	3,700	7,232	12,107	20,891
United States	2,819	5,633	9,021	30,635	52,914	92,700

The greatest length completed in any one year in Germany was 1,517 miles, in 1875; in this country it was about 11,500 miles, in 1882—more than was ever built in any ten years in Germany.

The number of passenger trains on some of the English roads is greater than anywhere else in the world, probably, except on the New York elevated roads. A French engineer who has recently investigated the subject has made a table showing the number of trains despatched every 24 hours on certain roads and parts of roads. This table shows that on many lines there are more passenger than freight trains, and this is especially the case south of London. The number on the London end of a road, however, usually includes an immense number of suburban trains. On some of the trains are:

	Distance, miles.	Pass.	Freight.	Total.
London to Swanley	17.0	91	37	128
Turnbridge	29.5	85	14	99
Brighton	25.5	69	48	117
Woking	24.2	147	51	198
Reading	42.2	112	72	184
Bletchley	47.1	70	133	215
Leicester	39.2	129	190	319
Hitchin	32.0	225	93	321

To Hitchin, Bletchley and Leicester the roads have four tracks. Usually there are very few freight trains by day and very few passenger trains after midnight.

Tests of Materials at the Chicago Exhibition.

The following circular has been issued dated March 20, 1883:

To the Civil, Mechanical, Hydraulic and Mining Engineers of North America.

The Commissioners of the National Exposition of Railway Appliances invite your attention to the proposed tests of the strength and quality of substances used in general construction, to be made during the Exposition, from May 24 to June 23, 1883.

That these tests may be full and complete, and of an extended and varied character, engineers who contemplate visiting the Exposition are solicited to bring with them or send specimens of useful substances for the purpose. A record of these tests will be faithfully kept and afterwards published. It is to be hoped that all who can will avail themselves of this opportunity to learn the quality and strength of the material you build with in your respective localities, and without expense to yourselves.

Suggestions from engineers or others which will promote the efficiency of these tests are respectfully solicited. Special working forms of iron and steel are solicited, especially those which are subjected to constant or severe strains or blows.

A first-class prize will be given to the manufacturer producing, by actual test, the best and strongest upset eyebolt, and upset rod for threading.

Specimens of stone should be in cubes of two inches. Stone cubes from old structures which have been exposed to unusually deleterious influences are requested.

Specimens of useful wood, of which no tests have been recorded, are requested.

A written description of each specimen sent for testing, including a full account of the mode of manufacture, must accompany it; otherwise no test will be made.

If the specimen is of metal, name the ore it is made from and describe its manufacture and purpose.

If a stone specimen, give the date when quarried (unless from an old structure and not known), kind of stone and the location of quarry, naming the town, county and state.

If a wood specimen, give the date of felling the tree of which it is a part, the common name of the wood, also botanical name if known, the average diameter and height of the species; state whether it is deciduous or perennial, and what, if any, useful purpose it has served in its native region.

All wood specimens should be of the following dimensions: For tensile strength, 2 in. x 2 in. x 3 ft. long. For compressive strength, 6 in. x 8 in. x 1 ft. long.

Specimens of rope made from steel or iron, or from manilla, hemp, or any vegetable substance, also of belting of every description, are solicited.

WILLIAM SOOY SMITH, C.E.,

K. F. BOOTH, C.E.,

W. F. GOODHUE, C.E.,

WILLIAM H. LOTZ, M.E.,

CHESTER B. DAVIS, Hydraulic Engineer,

Committee.

WILLIAM SOOY SMITH, Chairman.

Address all correspondence, specimens, etc., to E. H. TALBOTT, Secretary, Grand Pacific Hotel, Chicago.

THE SCRAP HEAP.

Locomotive Building.

The Rhode Island Locomotive Works in Providence are building two passenger engines for the Boston & Maine road. H. K. Porter & Co. in Pittsburgh have a number of contracts on hand for light locomotives.

Car Notes.

The Gilbert & Bush Car Works in Troy, N. Y., have just completed two combined sleeping and parlor cars to go to Australia. They are light and very handsome cars with some new features about them, and were designed by Mr. G. Leve, of New York.

Billmeyer & Small, in York, Pa., have several contracts for freight cars, both standard and narrow gauge.

Bridge Notes.

Alden & Lassic, of the Rochester Bridge & Iron Works in Rochester, N. Y., have taken several contracts for bridges for the Canadian Pacific road.

The Chicago, Burlington & Quincy shops in Aurora, Ill., are building 12 bridge caissons to be used on the St. Louis, Keokuk & Northwestern road. They are of boiler iron ½ in. thick, and are 50 ft. in height, tapering from 15 ft. diameter at bottom to 12 ft. at top.

Clark, Reeves & Co., at Phoenixville, Pa., have taken the contract for a bridge over the Susquehanna at Harrisburg, Pa., for the new Harrisburg & Western road.

The Morse Bridge Works at Youngstown, O., have a number of orders for railroad and highway bridges to fill.

Iron Notes.

The Bethlehem Iron Co., in Bethlehem, Pa., is making heavy shipments of steel rails to California.

J. L. Edwards & Co., owners of the rolling mill at Canal Dover, O., have made an assignment, with liabilities of \$50,000, and about \$30,000 assets.

Martel Furnace at St. Ignace, Mich., has gone out of blast. It has been making charcoal car-wheel iron.

The blast furnaces of Allegheny County, Pa., produced 358,840 net tons of pig iron in 1882, compared with 385,453 tons in 1881, and 300,497 tons in 1880. Thus, the production was 26,613 net tons less last year than in 1881, but 58,343 tons more than in 1880.

Manufacturing Notes.

The L. B. Flanders Machine Co., in Philadelphia, has lately sent locomotive cylinder boring machines to the Boston, Hoosac Tunnel & Western; Roanoke Machine Works; Pittsburgh & Lake Erie; North River Construction Co.; Cumberland & Pennsylvania, and the Brooklyn, Flatbush & Coney Island roads; valve seat rotary planing machines to the Missouri Pacific; New York & New England; Roanoke Machine Works; North River Construction Co.; Baltimore & Ohio; Grand Trunk; Delaware, Lackawanna & Western and the New York, Chicago & St. Louis roads; crank pin machines to the New York & New England and the Florida Transit roads, and the Brazilian Government; Greenwood's universal planer chucks to L. G. Tiltott & Co.; the Raleigh & Gaston, and the Delaware, Lackawanna & Western roads.

The Springfield Foundry Co., in Springfield, Mass., is making a great many railroad castings, including locomotive cylinders, driving wheels, cross heads, etc., and car castings; also thin castings for steam-chest casings and similar work. The company has special facilities for making locomotive, car and bridge castings.

The Rail Market.

Steel Rails.—There has not been much business done, although there have been a good many inquiries, and prospects are that something will be done before long. Sales to the extent of 20,000 tons are reported by Western mills, but the price is said to have been very little, if anything, above \$38. Eastern mills quote \$39, and are firm, unless quantity and time for delivery are specially favorable. Light rails quoted \$40 to \$41.

Rail Fastenings.—The market is quiet and unchanged, prices remaining about as last week.

British Rail Exports.

Exports of steel and iron rails from Great Britain for the month of February, and for the two months ending with February, to the United States and to all countries are reported as follows by the Board of Trade, in tons of 2,240 lbs.:

	February.		Two Months.	
To United States:	1881.	1882.	1881.	1882.
Iron rails	10,419	5,404	10,030	14,167
Steel rails	4,380	17,774	3,037	36,278
Total	14,799	23,178	4,066	50,445
To all countries:	1881.	1882.	1881.	1882.
Iron rails	10,945	7,068	4,061	18,029
Steel rails	20,672	56,354	49,086	43,012
Total	31,617	63,422	53,147	61,041

The exports to this country in February were thus 82 per cent. less than last year and 72 per cent. less than in 1881. For the two months the decrease from last year is 80 per cent., and for 1881 it is 55 per cent.

The total exports to this country in February were the smallest since July, 1879, but they have been very small ever since October. The monthly average in the first half of last year was 20,467 tons; in 1881, 24,178 tons; in 1880, 18,273 tons. The exports of iron rails, however, were the largest since May last—indeed, larger than the totals for eight months previous. Still they are so small as to have no significance.

The British exports to countries other than the United States in February were larger than any previous year, and for the two months they were 114,479 tons, against

80,878 in 1882 and 89,774 in 1881. This year no less than one-third of the total exports were to the unnamed "other countries," of which Mexico probably was the chief. But while the United States took 8.2 per cent. of the total British exports, 23.8 per cent. went to India, 13 per cent. to Australia, 10.2 to Italy, 5.7 per cent. to Canada, 3.7 per cent. to Brazil, and 1.5 per cent. to Spain. Italy seems now to be the only important European customer for British rails. It is worth noting that steel rails formed 94 per cent. of the total exports.

Regulating Union Pacific Eating-Houses.

Mr. M. M. Towne, Superintendent of the eating-houses on the Union Pacific road, has issued the following notice to eating-house proprietors on that line: "On and after March 20, 1883, the company will give free transportation, by freight and express, on all food supplies for use of eating-houses. This does not include car-load lots, and nothing will be shipped by express that can just as well go by freight. In consideration of this free rate, on and after the above date, you will charge passengers not to exceed 75 cents for each meal; all trainmen connected with the passenger trains not to exceed 25 cents for each meal. You will charge not to exceed 10 cents for each cup of tea or coffee, 10 cents for each sandwich, 10 cents for each quarter of pie, and everything in your lunch-room in like proportion."

Railway "Old Probs."

J. White Sprong, Secretary of the Delaware & Hudson Canal Co., has established, under the direction of the company, a railway signal service or weather bureau. The station agents at Binghamton, Ninevah, Oneonta, Cokeskill, Albany, Schenectady, Mechanicville, Ballston Spa, Saratoga Springs, Fort Edward, Whitehall, Lake George, Rutland, Fort Henry, Plattsburg and Rouse's Point have been instructed to make reports by telegraph at intervals during the day of unusual changes in the meteorological conditions of their localities. This record will enable the division superintendents to anticipate and guard against disarrangements of train time schedules by floods, snow blockades, etc.

A Large Steamboat.

The Old Colony line-steamers "Pilgrim" is so far completed, in New York, that she has been opened to public inspection. She is the largest boat of the line, having a length over all of 387 ft.; beam, 50 ft.; beam over guards, 87 ft.; depth of hold, 14 ft. She has two saloon decks above the main deck, and 280 first class staterooms, with accommodation for 560 passengers. She is licensed to carry in all 1,200 passengers. She has a beam engine of 5,000 horsepower, with a cylinder of 110 in. diameter, and 14 ft. stroke. It is expected that she will make 20 miles an hour. The saloons are fitted up with mahogany, and the ceilings frescoed in delicate and cheerful colors. The staterooms are furnished with folding beds and electric bells, and the doors are secured by locks that cannot be opened with pass-keys. Many of the staterooms are connected with each other, so as to be thrown en suite for the convenience of families. The "Pilgrim's" furniture will be put on board at Newport. The boat will be lighted with electric lights, having nearly 1,000 of Edison's lights on board, power for which is furnished by three engines.

Explosion in a Mail Car.

Late yesterday afternoon the steam heater in a Vandalia mail car, lying on a side-track at the Union depot, exploded and effectively demolished one end of the car. A couple of men were in the car at the time, but luckily were working in the end opposite that in which the heater is located. It is not known what caused the explosion. The first those on the ground knew was a deafening report, followed by a crash of timber, and when they looked up the depot could be seen through an end of the car. A piece of the heater went through the roof and continued its course until it struck the door of an adjacent freight depot, through which it made a hole large enough for a man to crawl through. The car will be taken to the shops for repairs.—*St. Louis Republican*, March 26.

A Railway Hospital Arrangement.

A new system for the dispensing of medical and surgical aid to the sick and injured employes of the Denver & Rio Grande Railroad is to be inaugurated on April 1. The following are the rules and regulations adopted:

First—It is hereby directed that from April 1, 1883, there shall be deducted from the monthly compensation of each employe, of every class, in the service of the Denver & Rio Grande Railway Company, the sum of 50 cents, for the purpose of creating an invalid fund.

Second—The subscribers shall be entitled to medicines and medical attendance free of charge, or admission into one of the company hospitals, hereafter designated, when sick from diseases contracted in the service of the company, or from injuries sustained in the line of their duty.

Third—If any employe does not desire to go to the hospital, he can receive medical attendance free at his home in any of the towns in which a company physician resides, but his board will be paid by the fund only when he goes to a company hospital or one which the company patronizes.

Fourth—An employe who desires medical treatment must first bring from his superintendent or foreman a certificate stating time, place and circumstances of his case to the nearest company surgeon, who will either, according to his judgment, administer such treatment as he may require at the place in which he resides or forward him to a company hospital.

Fifth—Whenever an employe quits the service of the company he ceases to be a participant of the fund and superintendents and foremen are forbidden to issue certificates to such a person.

Sixth—Employe sick from the results of intemperance, vicious habits, or old diseases contracted prior to entrance into the service of the road, will not be entitled to aid from the invalid fund.

Seventh—Any employe who has a chronic disease which is liable to render him a burden to the fund, to an extent unjust to other employes, may be dropped from the assessment roll upon the recommendation of the chief surgeon.

Eighth—No employe will be permitted to remain in the hospital at the expense of the fund for a period exceeding four months, without consent of the Senior Surgeon or General Manager of the road.

Ninth—Employe who shall become intoxicated in hospital or become insubordinate to the rules thereof, may be discharged and dropped from the benefits at once upon the order of the Senior Surgeon.

Tenth—Assessments upon employes who labor a fractional portion of the month will be made in the following: Those who work less number of days than half a month will contribute to the fund 25 cents; those who work over a half month, and less than a full one, will contribute the full sum.

P. S.—The company recommends that an insurance fund be established at an early date, whereby every employe shall contribute 50 cents from his wages every month. This shall entitle him to \$25 per month for time actually lost from injuries sustained by accidents occurring in the line of his duties, or \$300 for the loss of a foot or a hand, or \$500

payable to his heirs in the event of death. The surplus fund shall be allowed to accumulate until it reaches \$30,000. The employes of the Denver & Rio Grande Railway shall have the first right to borrow this money in securing homes for themselves, at 6 per cent. per annum, provided they give ample security.

Government Tests of Materials.

At the regular monthly meeting of the American Society of Civil Engineers, held in New York, March 21, the subject of a continuance of tests of structural materials was considered. The Secretary made a statement of what had been done up to the present. Mr. O. Chanute, Chairman of the Committee on this subject, related the effort that had been made to secure larger appropriations from Congress; and the subject of the best method for conducting and continuing tests and of collating results so as to secure desirable information was discussed by Messrs. A. P. Boiler, L. L. Buck, John Bogart, O. Chanute, T. C. Clarke, Theodor Cooper, Charles E. Emery, Robert L. Harris, Charles Macdonald, Wm. H. Paine and S. H. Shreve. Letters were read from Gen. S. V. Benét, Chief of Ordnance, stating that the programme adopted for continuing tests of structural materials would be carried out on the Watertown testing machine to the extent of the very small amount appropriated by Congress; and the circular from the Chief of Ordnance, embracing that programme, was also read. A resolution was adopted to the effect that it was the sense of the meeting that a special committee should be appointed by the board of directors, to prepare and promote such a programme of tests of structural materials as to secure the best results possible from the Watertown Arsenal experiments.

Wheel Mileage on the Lake Shore Road.

The report of engine, tender and passenger car wheel mileage on this road for the year 1882 has just been issued by the Purchasing Agent, Mr. A. C. Armstrong. The average mileage of 2,265 33-inch cast-iron chilled wheels drawn was 60,580 miles each; the average of 747 30-inch wheels was 57,519; that of 393 28-inch wheels was 56,088, and six 26-inch wheels averaged 97,297 miles each. Of the 2,265 33-inch wheels drawn 1,609 were worn out; 536 were flat owing to bad chill or crumbled tread; 51 had broken treads; 25 broken plates, and 44 sharp flanges. Besides the 2,265 33-inch wheels removed for the causes named, 407 were drawn because they had been made flat by sliding. The average mileage of these 407 wheels was 25,168 miles each.

The average mileage of all cast-iron wheels removed during five years from the equipment named above, which does not include freight cars, excepting those made flat by sliding, was as follows: 33 in. wheels, 60,335; 30 in. wheels, 48,299; 28 in. wheels, 49,867; 26 in. wheels, 63,878.

The average mileage of all the wheels reported "worn out" during five years was 71,059, and the average mileage of wheels made flat from sliding in the same time was 24,065. The number of wheels removed from the latter cause was as follows: in 1878, 18; in 1879, 45; in 1880, 72; in 1881, 205; and in 1882, 407. The great increase in the number removed from this cause in 1881 and 1882 is probably due to the use of continuous brakes, or perhaps rather from inexperience in the use of them.

Fire-Proof Sleeping Cars.

The New York Herald has the following article advocating the construction of fire-proof sleeping cars and passenger coaches: "There is no good reason why sleeping cars, and in fact all passenger cars on steam railroads should not be thoroughly fire-proof. There are special reasons why they should be so constructed. They are peculiarly exposed to risk of fire and are freighted with thousands of human lives. Yet they are mere tinder boxes, and once on fire are almost instantly consumed by the flames. The great danger to life from combustible cars was forcibly illustrated by the burning of a sleeper on the Pennsylvania Railroad early yesterday morning, though fortunately no lives were lost, and it was more terribly illustrated by the Spuyten Duyvil disaster on the Hudson River Railroad, in which the loss of life was largely due to the burning of the wrecked cars. It would seem to be easy and entirely practicable to construct passenger-cars of metal or other unflammable materials so as to make them absolutely fire-proof, and the traveling public has a right to demand of the wealthy corporations of the country this safeguard against danger and loss of life. In the building of ocean steamers iron and other metals have largely taken the place of wood. It is high time that a new departure of this kind be taken in the construction of cars for the carriage of passengers by land."

A Compressed Air Locomotive.

What is undoubtedly the first practical attempt to use compressed air as an underground motor in a coal mine in this country is meeting with success at the Old Eagle pits of W. H. Brown Sons, 27 miles up the Monongahela above Pittsburgh. The new motor was built at the Baldwin Locomotive Works, and is a most singular looking affair. The available height above the pit rails being only 5 ft. 10 in., the air locomotive had to conform thereto. The air receivers are 27 ft. long, and 38 in. in diameter, and made of sheet steel. These are filled with air compressed to 400 lbs. per square inch, forming the actuating power of the machine. These air receivers rest on four wheels, driven by a pair of locomotive cylinders, gearing, etc., just as in a railway engine, the air taking the place of steam. The originator of this idea, Capt. Harry Brown, expressed himself as more than satisfied with this locomotive. It does the work of a score of mules, requires the attention of only one man—who also operates the air compressing machinery and can haul 55 loaded cars (60 tons) up a gradient of 100 ft. to the mile.—*Coal Trade Journal*.

Experiments on "Preptual" Motion.

The Tech gives the following from a postal-card directed to the "Machinery School, Boston":

"STATE CENTRE FEB 21.

"Will you please tell me how Your institution is run and what its aims are and if You would experiment on preptual motion for half the enterprise in the United States if You had a good theory advanced that looks reasonable and the cost would not be more than the cost of a dump cart.

"Yours truly,

"marshall, Co., Iowa."

Courting by Steam-Whistle.

It has long been a mystery to us why there has been so much unceasing tooting, blowing and screeching of locomotive whistles on the incoming and outgoing trains running through the city. It now seems that the practice is indulged in by engineers as a means by which to salute their wives and sweethearts along the line of railroad at which they reside, or to wake up a sleeping chum, and that these signals and their meaning are well understood by the parties for whom they are intended. We have heard it stated, on good and unquestionable authority, that an engineer on one of the trains on the Binghamton & Syracuse road blows a signal for his wife when his train is nearing the city, which she understands to have his supper ready for him within the next twenty minutes, at which time he is invariably at home, and sits down at his own table to participate

in the meal. There may be sense in this as a signal, but courting by steam-whistle along the line of railroad is something both novel and absurd, while it is annoying to the community. This way of making love is too loud and indelicate.—*Binghamton (N. Y.) Republican*.

"Owner's Risk."

A country darkey came into the Columbus, Georgia, office with a very large jug, containing some corn whiskey, he said, to send to a friend at a point where prohibition ruled. Charley Couch was on the sidewalk helping lift a big box into a wagon, so Henderson, the money clerk, made out his receipt—the darkey took it, and said:

"Boss, please read dat over for me?"

Henderson complied, and read "owner's risk."

"What dat mean, boss?"

"Why, it means that the express company won't pay for it if it should get broken, as it is not properly packed, you see."

"Yes, sir. But if de man who carries it gets dry, he kin jis break it and git a drink!"

"Ah!" says H., "but we don't employ any such kind of people. Our messenger has charge of it, and they are all temperance men—all have to take the oath before they are employed."

"Dat o' all right, boss, but I've seed lots o' temperance men who wouldn't want a better chance dan a full jug, in a empty car, and da all alone."

Just then Charlie Couch came in—his jolly fat face redder than ever from his exertion. The countryman looked at him, and said, as he walked away:

"Boss, is he a messenger?"

"Oh, yes; an old timer, one of the best in the business."

"Good ebenin'; tar up yo receipt! I givin' to put dis yer licker in a keg."—*Express Gazette*.

A Natural Electrical Motor.

A most remarkable electrical phenomenon manifested itself on the line of the Union Pacific Railway recently, between North Platte and Sidney. The influence, however, was felt perceptibly beyond those points. The rails were surcharged with a current of electricity, moving from west to east, to so high a degree that hand cars standing on the track were impelled at a fair rate of speed by it. One hand car at Brule got away from the section men next east. The influence of the current was felt by many persons along the track and no little excitement prevailed during its continuance.—*Denver Tribune*.

General Railroad News.

MEETINGS AND ANNOUNCEMENTS.

Meetings.

Meetings will be held as follows:

Allegheny Valley, annual meeting, at the office in Pittsburgh, April 10, at 11 a. m.

Atchison, Topeka & Santa Fe, annual meeting, at the office in Topeka, Kan., April 19. Transfer books close March 19.

Lake Shore & Michigan Southern, annual meeting, at the office in Cleveland, O., May 2. Transfer books close March 30.

Michigan Central, annual meeting, at the office in Detroit, Mich., May 3. Transfer books close March 30.

Railroad Conventions.

The *General Time Convention* will hold its spring meeting at the Lindell House in St. Louis, April 11.

The *Southern Time Convention* will meet at the National Railway Club Rooms, No. 46 Bond street, New York, April 18.

The *Car Accountants' Association* will hold its annual convention in Philadelphia, May 22.

The *General Baggage Agents' Association* will hold its next semi-annual meeting at the Tremont House, Chicago, Aug. 8.

Technical Meetings and Conventions.

The *Master Car-Builders' Association* will hold its annual convention in Chicago, beginning June 12 next. The meeting will be held in the Grand Pacific Hotel. The charge at that hotel to members will be \$3 per day for ordinary rooms.

The *Master Mechanics' Association* will hold its annual convention in Chicago, June 19 next.

Dividends.

Dividends have been declared as follows:

Chicago, Rock Island & Pacific, 1½ per cent., quarterly, payable May 1. Transfer books close March 30.

Chicago, St. Paul, Minneapolis & Omaha, 1½ per cent., quarterly, on the preferred stock, payable April 20. Transfer books close March 31.

Danbury & Norwalk, 2½ per cent., semi-annual, payable April 20. Transfer books close April 10.

Lake Shore & Michigan Southern, 2 per cent., quarterly, payable May 1. Transfer books close March 30.

Montgomery & Enfaula, 10 per cent., payable on demand.

Newport & Cincinnati Bridge, 3 per cent.

Woodruff Sleeping & Parlor Coach Co., 1½ per cent., quarterly, payable April 2.

Foreclosure Sales.

The *Mobile & Alabama Grand Trunk* road will be sold in Mobile, Ala., May 7, under a decree of the Court of Chancery. No bid for less than \$350,000 will be received: the terms of sale are \$2,000 cash at the time of sale, \$10,000 in cash within five days, and the balance in 30 days, either in cash or in bonds and coupons at their *pro rata* value. The road is completed from Mobile to Bigbee Bridge, 56½ miles, with a connection one mile long with the Mobile & Ohio near Touminville. It has not been operated for several years. The funded debt consists of \$1,124,000 first-mortgage bonds, with about eight years' unpaid interest.

Southern Railway & Steamship Association.

General Commissioner Powers has issued the following circular:

"Please take notice that this office will be removed to Atlanta, Georgia, on April 1, 1883. Address all communications accordingly."

"The office will be located on the third floor of Jackson's Building, corner of Alabama and Pryor streets, half a block from the Union passenger depot."

"All agents making deposits will be careful to have new accounts opened at the banks they deposit with, specifying Atlanta, Georgia, as the headquarters of this office, beginning with deposits for way-bills of April 1. Special attention is called to this in order that we may close up accounts to March 31, and open a new set of books entire with April 1."

ELECTIONS AND APPOINTMENTS.

Atlantic & Pacific.—Mr. George Chalender, Superintendent of Motive Power and Machinery, has been appointed

also Superintendent of the Albuquerque Division, from Albuquerque to Winslow, with office at Albuquerque, N. M. Mr. I. N. Horner is appointed Train-Master of the Albuquerque Division, with office at Coolidge, N. M. Mr. Daniel Hardy, Superintendent of Telegraph, is appointed also Superintendent of the Arizona Division, from Winslow to the Colorado River, with office at Williams, Ar. Mr. T. M. Daly is appointed Chief Operator, and will also have charge of all repairs of telegraph. Mr. J. C. Burnet is appointed Traveling Auditor.

Boston, Concord & Montreal.—Mr. W. A. Cobb is appointed Cashier in place of R. M. Bowen, resigned. Mr. J. H. Carpenter succeeds Mr. Cobb as General Freight Agent.

Chattahoochee & East Pass.—This company has elected H. S. Haines, President; W. P. Hardee, Secretary and Treasurer. It is controlled by the Savannah, Florida & Western.

Chicago, St. Louis & Pittsburgh.—The full list of officers of this company (successor to the Columbus, Chicago & Indiana Central) is as follows: President, Wm. L. Scott, New York; First Vice-President, J. N. McCullough, Pittsburgh, Pa.; Second Vice-President, Wm. Thaw, Pittsburgh, Pa.; Third Vice-President and Comptroller, Thomas D. Messler, Pittsburgh; Assistant Comptroller, John W. Renner, Pittsburgh; Auditor, A. McElevy, Pittsburgh; Treasurer, M. H. Taylor, New York; Assistant Treasurer, M. C. Spencer, Pittsburgh; Paymaster, John C. Snee, Columbus, O.; Secretary, S. B. Liggett, Pittsburgh; Assistant Secretary, A. Stull, New York; Manager, James McCrea, Columbus, O.; General Freight Agent, D. T. McCabe, Chicago; General Passenger and Ticket Agent *pro tem*, E. A. Ford, Chicago; General Counsel, J. T. Brooks, Pittsburgh; Assistant Counsel, J. J. Brooks, Pittsburgh. The New York office is at No. 160 Broadway.

Cincinnati Railway Tunnel Co.—This company elected, in Cincinnati, March 20, the following officers: President, A. J. Hodder; Secretary, S. H. Goodwin; Treasurer, Richard Beresford.

Council Bluffs & Northern.—The officers of this new company are: President, J. W. Chapman; Vice-President, E. L. Shugart; General Manager, J. J. Brown; Secretary, Thomas Bowman; Treasurer, Samuel Haas. Offices in Council Bluffs, Iowa.

Dayton & Union.—At the annual meeting in Dayton, O., March 20, the following directors were chosen: R. D. Marshall, J. H. Dwyer, Stevenson Burke, H. H. Poppleton, E. B. Thomas, J. H. Carlisle, E. A. Ferguson, F. H. Short, C. C. Waite. The board elected C. C. Waite President; E. B. Thomas, Vice-President; George H. Russell, Secretary and Treasurer; J. H. Barrett, General Superintendent; H. H. Poppleton, Attorney.

East Tennessee, Virginia & Georgia.—Mr. T. D. Kline is appointed Assistant Superintendent of the Georgia Division, and will have charge of the section from Rome to Macon, in place of Major M. Beatty, resigned. Assistant Superintendent Mallory will retain charge of the section from Macon to Brunswick. No Superintendent is appointed for the whole division in place of Mr. W. V. McCracken, promoted, the Assistant Superintendents reporting directly to the General Superintendent at Knoxville.

Lackawanna & Pittsburgh.—The officers of this company as consolidated are: President, Archer N. Martin; Vice-President, Frank Smith; Secretary and Treasurer, C. E. Kimball.

Mexican National.—The following appointments are announced for the Frontier Division, which includes the Northern Division of the Mexican National and the Texas-Mexican road:

Mr. C. A. Merriam is appointed Assistant Superintendent and Engineer and will have charge of the Maintenance of Way Department of this division, with headquarters at Nuevo Laredo, Mexico. All officers of this Department report to and receive their instructions from him.

Mr. F. W. Baldwin is appointed Train-Master of this division, with headquarters at Laredo, Tex. He has charge of the movement of the traffic, distribution of cars and supervision of train and yardmen. Train-dispatchers report to and receive their instructions from him, and issue train orders in his name, except when otherwise ordered.

Mr. J. W. Ward, Agent at Corpus Christi, Tex., has general charge of all employees at that point. The yard engine at Corpus Christi is under his control, subject to the orders of the Train-Master, and employees of the motive power and maintenance of way departments report direct to the heads of their respective departments. Mr. J. B. Mitchell, in charge of the lighters and other vessels belonging to this company, reports all matters concerning the movements of his vessels to Mr. Ward, and obeys his orders concerning the same. In all other matters he reports to the general office as heretofore.

The duties of A. E. Spohn, M. D., Surgeon of the Texas-Mexican Railway, are extended over the entire division, with headquarters remaining at Corpus Christi. He has charge of the medical service of the division, and is authorized to organize the same, appointing such assistants as may be necessary.

Monson.—At a meeting held in Bangor, Me., last week, the following officers were chosen: President, H. A. Whiting, Wilton, N. H.; Treasurer and General Manager, George S. Cushing, Lowell, Mass.

New England Railroad Club.—This club has been organized in Boston with the following officers: President, F. D. Adams; Vice-President, J. W. Marden; Secretary and Treasurer, George E. Pratt; Executive Committee, F. D. Adams, J. W. Marden, Amos Pillsbury.

Newport & Cincinnati Bridge.—At the annual meeting in Cincinnati, March 20, the following were chosen: President, Thomas D. Messler; Directors, Albert S. Berry, D. S. Gray, Wm. King, C. H. Kilgour, Ralph Peters, Wm. Ringo; Secretary, S. T. Liggett; Treasurer, J. E. Davidson.

Pennsylvania.—At the annual election, March 27, the old board was re-elected, as follows: George B. Roberts, Wistar Morris, Alexander Biddle, N. Parker Shortridge, S. M. Felton, Henry M. Phillips, D. B. Cummins, Henry D. Welsh, Alexander M. Fox, John Price Wetherill, Wm. L. Elkins, H. H. Houston and Wm. Thaw.

The board re-elected Geo. B. Roberts President; Edmund Smith, First Vice-President; Frank Thomson, Second Vice-President; J. N. DuBarry, Third Vice-President; John P. Green, Fourth Vice-President; John C. Sims, Jr., Secretary; John D. Taylor, Treasurer.

Pennsylvania Company.—Mr. James P. Orr has been appointed Division Freight Agent for this company for the Eastern Division Pittsburgh, Fort Wayne & Chicago Railway and the Alliance, Niles & Ashtabula Railroad, vice J. S. Davison, resigned. Appointment to take effect April 2.

Portage, Westbourne & Northwestern.—This company has elected officers as follows: President, Andrew Allen, Montreal; Vice-President, Duncan McArthur, Winnipeg, Man.; Secretary and Treasurer, F. H. Brydges, Winnipeg.

Spring Grove, Avondale & Cincinnati.—At the annual meeting last week the following directors were chosen: G. L. Barringer, P. S. Dudley, Gabriel Netter, Charles Rice, John Ryan. The board elected John Ryan President; Chas. Rice, Secretary and Treasurer.

Texas, Topolovampo & Pacific.—This company has elected directors as follows: Benjamin F. Butler, E. W. Cushing, Frederick O. Prince, George W. Simmons, Boston; U. S. Grant, Jr., Elisha A. Burk, New York; Benjamin R. Carman, O. K. Owen, Philadelphia; J. H. Rice, A. R. Shepard, Washington; Joseph E. Brown, Atlanta, Ga.; David M. Yulee, Fernandina, Fla.; W. K. Rogers, Cincinnati; Charles M. Loring, Wm. Windom, St. Paul, Minn.; Ramon Fernandez, Ignacio Pombo, F. M. de Prida, Mexico. The board elected Wm. Windom President.

Toledo, Cincinnati & St. Louis.—Mr. E. E. Dwight has been appointed General Manager, in place of T. A. Phillips, resigned. Mr. Dwight was formerly on the Cincinnati, Hamilton & Dayton, and more recently Superintendent of the Western Division of the New York, Chicago & St. Louis.

Trunk Lines Commissioner.—Mr. S. F. Pierson has been appointed Assistant Trunk Lines Commissioner and will have charge of the Passenger Department, from which Commissioner Fink asked to be relieved some time ago.

Union Pacific.—Mr. John Wilson is appointed Superintendent of Motive Power and Cars, with office at Omaha, Neb., to date from April 1, in place of John McKenzie, resigned.

Western of Alabama.—The following directors have been chosen: J. H. Hamilton, Thomas G. Jones, C. H. Phinizy, W. G. Raoul, Henry C. S-mple, Milton H. Smith. The board elected L. P. Grant, President; M. H. Abbott, Secretary and Treasurer.

Wisconsin Central.—Mr. Wm. A. Short is appointed Master Mechanic in place of J. B. Henny, resigned.

Woodruff Sleeping & Parlor Coach Co.—At the annual meeting last week the following were chosen: President, Frank Rabm; Vice-President, James Irwin; Directors, James H. Hopkins, W. G. Johnston, J. M. McClintock, E. Poulson, E. J. Unger, Henry Whelen; Secretary and Treasurer, Augustus Triump.

PERSONAL.

—Major M. Beatty has resigned his position as Assistant Superintendent of the Georgia Division of the East Tennessee, Virginia & Georgia road.

—Mr. W. E. Lewis has resigned his office as General Superintendent of the Cleveland, Youngstown & Pittsburgh road, to accept a similar position on the Mexican National road, with headquarters in the City of Mexico. Mr. Lewis is a competent railroad man of long experience, and leaves many friends in this country. He was for several years a train dispatcher on the Erie, afterward for eight years Superintendent of the New Jersey Midland, which road he left two years ago for the position he has just resigned.

—Mr. H. B. Ledyard, General Manager of the Michigan Central road, has published the following notice: "Dr. D. O. Farrand, Surgeon-in-Chief of this company, died at Detroit, Sunday, March 18. He employed the high qualities of his heart and mind in the duties of the important and responsible position which he held. Eminent skillful in his profession, his genial nature and tender sympathy with the suffering won for him the respect and love of all with whom he came in contact. In his death the company loses an esteemed and faithful officer and his associates a cherished friend."

TRAFFIC AND EARNINGS.

Railroad Earnings.

Earnings for various periods are reported as follows:

Two months ending Feb. 28:

	1881	1882	Inc. or Dec.	P. c.
Central of Georgia.....	\$615,700	\$662,739	L.	\$47,039 7.1
Chl. & West Michigan.....	197,173	219,943	D.	22,770 10.4
Manassas, Hought. & Ont.....	48,363	48,681	D.	318 0.7
Norfolk & Western.....	891,832	918,211	L.	26,379 2.9
Net earnings.....	152,883	150,975	L.	1,908 27.3
Oregon & California.....	139,791	139,791		
Pennsylvania.....	7,611,532	6,980,051	L.	631,481 11.4
Net earnings.....	2,07,732	2,153,807	L.	63,863 30.3
Phila. & Reading.....	3,062,637	2,793,496	L.	269,141 9.0
Net earnings.....	1,301,437	1,066,045	L.	235,392 18.1
South Carolina.....	270,191	252,240	L.	17,951 10.7
Month of January:				
N. Y., Lake Erie & West.....	\$1,524,869	\$1,318,096	L.	206,773 13.6
Net earnings.....	394,577	182,743	L.	211,834 53.6
Oregon Improvement Co.....	240,245	240,245		
Net earnings.....	42,114	42,114		
Union Pacific.....	1,963,335	2,186,020	D.	222,685 11.3
Net earnings.....	901,622	769,981	L.	131,641 17.1
Month of February:				
Central of Georgia.....	\$334,500	\$396,953	L.	62,453 18.7
Net earnings.....	124,023	111,114	L.	12,909 20.2
Chl. & West Michigan.....	10,474	11,815	D.	1,341 11.6
Manassas, Hought. & Ont.....	17,000	22,640	D.	5,640 33.2
Norfolk & Western.....	191,345	190,619	L.	726 0.4
Net earnings.....	74,969	62,631	L.	12,338 16.4
Oregon & California.....	57,396	57,396		
Philadelphia & Reading.....	1,435,802	1,299,421	L.	136,381 9.5
Net earnings.....	610,085	410,082	D.	200,003 32.8
Pennsylvania.....	3,712,193	3,396,739	L.	315,454 8.5
Net earnings.....	1,336,874	1,079,601	L.	257,273 19.3
South Carolina.....	149,758	136,773	L.	12,985 8.6
Victorburg-Savannah & P.....	9,573	2,770	L.	6,803 238.4
Third week in March:				
Chl. & Alton.....	\$163,148	157,896	L.	5,252 3.2
Chl. & Eastern Illinois.....	31,434	31,888	L.	454 1.4
Chl. Mil. & St. Paul.....	405,000	379,245	L.	25,755 6.3
Chl. & Northwestern.....	474,800	372,910	L.	101,890 21.5
Denver & Rio Grande.....	122,700	123,700	D.	1,000 0.8
Louisville & Nashville.....	254,010	241,840	L.	12,170 4.8
Missouri Pacific lines.....	732,349	613,355	L.	118,994 16.2
Northern Pacific.....	149,100	84,250	L.	64,850 43.5
St. L. & San Francisco.....	80,200	63,900	L.	16,300 20.3
Month of December:				
Oregon Improvement Co.....	271,249	1881		
Net earnings.....	17,330			
St. John & Maine.....	12,549	\$12,400	L.	\$149 1.2
Net earnings.....	1,562	570		

* Deficit.

Grain Movement.

For the week ending March 17 receipts and shipments of grain of all kinds at the eight reporting Northwestern markets and receipts at the seven Atlantic ports have been, in bushels, for the past seven years:

Year.	Northwestern receipts.	Northwestern shipments.	Atlantic receipts.
1877.....	1,290,556	670,822	1,450,095
1878.....	2,728,322	1,830,874	4,041,054
1879.....	2,811,876	2,371,995	4,024,474
1880.....	4,302,800	3,694,550	4,737,406
1881.....	3,640,937	2,549,409	4,122,432
1882.....	1,968,778	2,234,242	1,116,032
1883.....	6,023,365	3,654,311	4,447,051

The receipts of the Northwestern markets for the week were larger than in the corresponding week of any previous year, and three times as much as last year. They were, however, a trifle less than the week before and 508,000 bushels less than the week to March 3.

The shipments of these markets for the week were a trifle less than in the corresponding week of 1880, but larger

than in any other year and 1,420,000 bushels (64 per cent) more than last year. They were, however, 807,000 bushels less than the week before, and smaller, also, than two weeks before. A large part of the decrease was in the Mississippi River shipments, which were 423,120 bushels, or 11.6 per cent, of the total.

The Atlantic receipts were exceeded in the corresponding week of 1879 and 1880, but were nearly four times as large as last year. They were 208,000 bushels more than the week before, 418,000 bushels less than the week before that, and larger than in any other week since November, and with one exception in November larger than in any other week since September.

While in the total Northwestern receipts there was a decrease of 51,500 bushels compared with previous week, at Chicago there was a decrease of 208,500, at Toledo 1,207,000, and at Detroit 126,000, while at St. Louis there was an increase of 321,000 and at Peoria 165,500. The St. Louis receipts are the largest since August. They were equalled in five weeks of July and August last year and in two of July, 1880, but in no other weeks. St. Louis has not so far this year received an unusual proportion of the grain—just 20 per cent of the total going to the Northwestern markets, against 21.1 last year, 28.7 in 1881, and 25.4 in 1880. Last week its proportion was 24.2 per cent. Corn forms 73 per cent of the St. Louis receipts, and but 54 per cent of the total receipts. The largest receipts of wheat were at Toledo.

Of the exports of the week amounting to 3,374,348 bushels, no less than 762,587 bushels went from New Orleans, probably a larger quantity than ever before. Two-thirds was corn.

For the week ending March 21 exports for three successive years have been:

	1881.	1882.	1883.
Flour, bbls.....	108,896	67,485	73,581
Grain, bu.....	3,786,665	1,188,979	3,603,709

The grain exports were the largest for a long time, but the St. Louis exports were extraordinary small.

Flour and grain exports from the whole United States in February were:

	1883.	1882.	Increase.	P. c.
Flour, bbls.....	902,633	564,490	338,143	71.4
Wheat, bu.....	5,606,035	5,318,183	287,852	6.5
Corn, bu.....	5,382,999	2,482,350	2,900,649	116.8
Other grains, bu.....	134,993	96,859	38,134	39.2

Flour and grain..... 15,245,845 10,266,637 4,979,208 47.9
Value..... \$15,773,009 \$11,175,193 \$4,597,816 41.1

Wheat and flour together were equivalent to 9,727,883 bushels this year, against 7,687,428 last year. Nearly half of the wheat went from the Pacific coast, but only about one-seventh of the flour. Baltimore led in corn exports.

Coal.

Coal tonnages for the week ending March 17 are reported as follows:

	1883.	1882.	Inc. or Dec.	P. c.
Anthracite.....	402,298	379,257	L.	83,041 21.9
Semi-bituminous.....	96,714	92,513	L.	4,201 4.5
Bituminous, Penna.....	58,803	53,356	L.	5,447 10.2
Coke, Penna.....	30,161	64,493	D.	34,332 22.9

The anthracite trade is quiet, with a fair demand, and prices not so much below the lists as they have sometimes been.

The tidewater market for semi-bituminous coals is extremely dull, and there is very little doing, although prices are fairly maintained.

The coal tonnage of the Pennsylvania Railroad for the week ending March 17 was as follows:

	Line of road.	From other roads.	Total.
Coal.....	133,473	43,923	177,396
Coke.....	41,809	8,352	50,161

Total..... 175,282 52,275 227,557

The total tonnage this year to March 17 was 2,526,534 tons, against 2,290,551 tons in 1882, an increase of 245,983 tons, or 10.7 per cent.

That the immense piles of culm or coal dust which gather around a colliery are a source of positive danger, as well as an inconvenience, is shown by the following from the Pottsville *Miners' Journal* of March 23:

"There are at present three large culm banks on fire in this county that have been in this condition only since the first of the year. Fire was discovered Tuesday on the bank at Kohinor colliery, Shenandoah. The fire has assumed large proportions already and, judging from this, must have been burning for some time. The work of extinguishing it was begun as soon as the fire was discovered. The outcrops of the Mammoth and Buck Mountain veins underlie the bank and apprehensions are entertained that the fire, if long unchecked, may be communicated to these."

"The culm bank of Dund's colliery, a small operation near Minersville, has also lately been on fire and necessitated the stoppage of the colliery for ten days. The colliery is expected to resume operations to-day."

"The dirt bank of Heaton's colliery, at Raven Run, has been blazing for a couple of months or so, for all efforts to extinguish it have been futile. The fire has increased though a 10-in. stream of water has been directed against it for weeks. Unless its advance is soon checked, it will be necessary to remove the dirt plane to prevent its destruction."

Cumberland coal shipments for the week ending March 24 were 44,013 tons. The total shipments this year to March 24 were 403,051 tons.

The coal tonnage of the Chesapeake & Ohio Railroad for the two months ending Feb. 28 was as follows:

	1883.	1882.	Increase.	P. c.
Coal.....	144,491	123,344	21,147	17.2
Coke.....	19,441	18,020	1,421	7.9

Total..... 163,932 141,364 22,568 16.0

The coal this year included 4,711 tons canal, 23,048 tons splint and block, 51,294 tons of gas coal and 65,438 tons New River coal.

Petroleum.

The production of the Pennsylvania and New York oil wells in February is given by *Stowell's Petroleum Reporter* as follows, in barrels of 42 gallons:

	1883.	1882.	Inc. or Dec.	P. c.
Production.....	1,756,188	2,131,332	D.	375,144 17.6
Shipments.....	1,250,824	1,787,900	D.	537,076 40.1
Stock, Feb. 28.....	35,692,480	27,050,011	L.	8,642,469 31.9
Producing wells.....	17,300	18,000	D.	700 4.0

The production was exceeded in every month of last year except December, in every month of 1881 except January, and in every month in 1880 except January. Of the total production the Allegheny District in New York furnished 19.1 per cent.; the Bradford District in Pennsylvania, 56.0 per cent.; the Middle districts 12.4 per cent., and the Southern districts, 12.5 per cent.

The shipments were greater than in December last, but, with that exception, have been exceeded in every month since February, 1881.

The stock on hand reported is all in the pipe lines. The increase in stock during the month was 505,364 barrels.

During the month there were 126 new wells completed, whose average daily production was 1,866 barrels each.

There were 21 dry holes reported during the month, and on Feb. 28 there were 151 new wells reported in progress. The shipments during the month were as follows:

	Barrels.	Per cent. of total.
New York.....	490,701	39.2
Philadelphia.....	108,884	8.9
Baltimore.....	27,075	2.2
Cleveland.....	324,042	25.9
Pittsburgh.....	38,761	2.9
Local points.....	142,571	11.4
Refined at Creek refineries.....	120,790	9.7
Total.....	1,250,824	100.0

Shipments of oil refined at Creek refineries (reduced to its equivalent in crude) were: New York, 46,147; Philadelphia 151; Baltimore, 627; Boston, 17,263; local points, 56,602; total, 120,790 barrels. Of the total shipments from the wells 374,648 barrels were by rail and 876,176 by pipe line.

New Orleans and Liverpool Steamer Line.

Though many steamers take cargoes of cotton from New Orleans to Liverpool from time to time, there has been till lately no regular line between the two places. Now Messrs. Thomas & James Harrison dispatch a steamer fortnightly by this route, and offer to put on a weekly steamer if business enough is offered to make it pay. They complain that the voyage from Liverpool does not pay, which is easy to understand, because New Orleans does not import much, but get its imported goods chiefly from New York. Mr. S. Frink, Manager of the organization of merchants known as the St. Louis Freight Bureau, calls the attention of St. Louis shippers to this line, and suggests that they give it their support. It would doubtless be of considerable advantage to New Orleans and the river route to have a regular weekly line, so that exports or imports of small quantities could be made at any time and without chartering a vessel. But the heavy cotton exports of New Orleans bring there a great many vessels at certain times of the year, which are likely sometimes to accept very low rates for grain and some other freights, in order to make out a load, so that it may often be cheaper to ship by them than by the regular line; and then there is the difficulty of a lack of imports and of passengers.

Pacific Through Freights.

Shipments of through freight eastward from California in February were 8,226 tons, of which 5,900 tons were from San Francisco and 2,326 tons from interior points. The Central Pacific carried 3,719 tons, or 45.2 per cent., and the Southern Pacific 4,507 tons, or 54.8 per cent. of the whole. Leading items of freight were 1,388 tons wool, 709 tons sugar, 602 tons rice, 560 tons lead and 508 tons of beans.

Weighing Freight in Chicago.

At a meeting of representatives of the freight departments of the lines running eastward from Chicago, held in that city March 21, an application was presented by the Shippers' & Receivers' Association to be allowed official weighmasters at the railroad companies' scales. The Association claimed that the business of its members was seriously embarrassed by the present method of weighing east-bound freight. After some discussion it was decided not to grant the application. The railroads are now making arrangements to secure the correct weighing of all east-bound freight.

Kansas Passenger Rates.

A meeting of general managers and passenger agents was held in Kansas City, Mo., March 25, to discuss the law recently passed, which fixes 3 cents per mile as the maximum rate of fare allowed to be charged for passengers. The Missouri Pacific, the Atchison, Topeka & Santa Fe, the St. Louis & San Francisco, the Union Pacific, and the Kansas City, Fort Scott & Gulf were represented. The whole question was generally discussed, and it was decided to comply with the law in every respect and to issue another rate-sheet at once. Beyond this nothing was done, and the meeting adjourned.

Provision Exports.

Provision exports continue very light. For February and the four months ending, the Bureau of Statistics reports:

February:	1883.	1882.	Inc. or Dec.	P. c.
Beef and tallow, lbs.	17,193,069	14,869,866	I. 2,323,203	15.6
Hog products, lbs.	68,215,785	72,032,555	D. 3,816,770	5.3
Total, lbs.	85,408,854	86,902,421	D. 1,493,567	1.7
Value.....	\$8,968,470	\$8,638,165	I. \$330,314	4.2
Four months:				
Beef and tallow, lbs.	59,381,437	60,578,536	D. 1,197,099	2.0
Hog products, lbs.	285,370,548	341,973,829	D. 56,603,281	16.5
Total, lbs.	344,751,985	402,552,365	D. 57,800,380	14.4
Value.....	\$36,959,769	\$40,623,311	D. \$3,663,542	9.0

It must be borne in mind that the exports last year were the lightest for several years.

The exports of dairy produce for the ten months ending with February were:

	1882-83.	1881-82.	Decrease.	P. c.
Pounds.....	96,744,775	143,976,744	47,231,969	32.8
Value.....	\$11,333,139	\$16,942,928	\$5,609,789	33.1

There probably has been no decrease in the production of butter and cheese; on the contrary, the Department of Agriculture reports an increase in the number of milch cows. The decrease in exports is probably due to an increase in the home consumption.

Ticket Commissions in San Francisco.

Mr. T. H. Goodman, General Passenger Agent of the Central Pacific, has just issued a circular to connecting roads regarding the evils of paying street commissions in San Francisco by the agents of Eastern roads in that city. Mr. Goodman says he received a short time ago the following telegram from the General Passenger Agents of the New York trunk lines:

"The trunk lines are of the opinion that the payment of street commissions in San Francisco should be abolished, and that you be authorized to discontinue the sale of tickets over any trunk, or intermediate lines continuing to pay such commissions after a date to be named by you, provided also that you will protect us as against contrary action on the part of competing lines. We understand that the Grand Trunk Railway concurs in this proposition, and we will be obliged if you will take this matter into your own hands and regulate it."

Mr. Goodman then quotes another telegram from the General Passenger Agent of the Grand Trunk concerning the above. Mr. Goodman goes on to say that having received similar requests from the General Passenger Agents of other Western and Eastern roads, he will name some future date to put the request into effect. In an explanatory letter Mr. Goodman stated that the payment of street commissions in San Francisco cannot be made chargeable to any officials or employees of the Central Pacific, and was not inaugurated, fostered or maintained by that company. On the receipt of the above-mentioned telegrams he inferred that all lines would approve the suggestions made for settlement of the trouble, but some make their acceptance conditional, while one road has protested against the proposition to cut off the commission business. On this account he (Mr. Goodman) decided to postpone action. He also states that the Southern Pacific business, which pays no commission, is

liable to great injury by the continuance of the commission system, which might be utilized by cut rates, as the Southern Pacific lines have no agents in San Francisco. He suggests the appointment of a Commissioner or Arbitrator to whom all questions of doubt or difference regarding this matter may be referred for adjudication, as he could not himself give the necessary time for the examination of correspondence and the data incidental to such cases.

RAILROAD LAW.

Consolidation in Connecticut.

The Connecticut House has passed the bill permitting railroad companies in that State to consolidate with companies in adjoining states. The original object of the bill was to permit the new Hartford & Harlem Co. to consolidate with the New York corporation of the same name, but it is general in its terms.

The bill contains a clause forbidding the consolidation of parallel and competing roads. It also contains a clause authorizing the issue of bonds by companies consolidated under its provisions.

Tennessee Railroad Commission.

The Tennessee Senate has passed the bill providing for a railroad commission of three members, with large powers of regulation, very similar to those of the Georgia Commission. The first commissioners are to be appointed by the Governor, but their successors are to be elected by the people.

OLD AND NEW ROADS.

Atlantic & Pacific.—Track on this road is now laid to a point 513 miles westward from Albuquerque, N. M., the end of the track being now 49 miles beyond the point last noted and 64 miles west of Yampai, Arizona. The work is progressing steadily towards the Colorado River.

Boston & Maine.—At the special meeting in Lawrence, Mass., March 28, the stockholders voted to ratify the agreement for the lease of the Eastern Railroad by a vote of 42,563 shares in favor to 953 opposed.

Boston & Maine and the Eastern.—Mr. Charles Francis Adams, Jr., in a letter showing the advisability of a practical consolidation of the Boston & Maine and the Eastern railroads, says:

"So far as the public is concerned the tendency, both of feeling and legislation, in respect to railroad development, is perfectly well defined. The proposed consolidation of these two roads is in direct accordance with it. That tendency is to look upon a railroad war as upon any other war, and upon a railroad peace as upon any other peace. The war is a wasteful, uncertain, semi-barbarous means of reaching a desired result. In place of it a system of regulation and arbitration is being rapidly developed. The railroad companies are allowed to grow and assume such forms as may be made convenient by the needs of work they have to do. The community relies for protection to its rights on governmental machinery, specially devised for the purpose. In the face of what every one who chooses can see, it is mere foolishness to say that this reliance amounts to nothing. Never was our railroad service so good, so uniform, so generally regarded of the just rights of the people, as it is at this time. It will unquestionably be a great deal more so in the future than it is now. But if it is to be so, the improvement will come in the future, as it has heretofore, through just such measures of development as that now proposed in the case of the Eastern and the Boston & Maine."

Central of Georgia.—This company's statement for the month of February is as follows:

Gross earnings.....	\$334,500
Expenses.....	210,457
Net earnings.....	\$124,043
Per cent. of expenses.....	62.92

As compared with February, 1882, there was an increase of \$84,547, or 23.9 per cent., in gross earnings; a decrease of \$18,382, or 8.0 per cent., in expenses, and an increase of \$82,929, or 202.2 per cent., in net earnings. This is a very good showing.

Central Iowa.—On the Peoria & Farmington Division of this road in Illinois, track is now laid to Keitsburg on the Mississippi River, 26 miles west by north from the late terminus of the Monmouth, and 92 miles from the eastern terminus at Peoria. At Keitsburg connection will be made by ferry with the Iowa Division of the road, which is not yet completed to the river.

Central Vermont.—The Boston Advertiser of March 28 says: "In the United States Circuit Court, at Burlington, Vt., yesterday, the celebrated Vermont Central Railroad litigation was brought to an end. In the case of Francis A. Brooks and others, holders of first-mortgage bonds, against the Vermont Central Railroad Co. and others, a decree of foreclosure was entered by arrangement between the litigants, and the other cases, eight in number, were discontinued. The cases have been in the state and Federal courts nearly 30 years. The amount due Mr. Brooks and his associates is \$1,500,000, and Judge Wheeler entered an order allowing the Vermont Central to pay an installment of \$500,000 in 10 days and the balance in six months; also allowing the second-mortgage bondholders to pay \$500,000 in 12 days, and the balance in six months and two days. Of course this equity will not be redeemed, and the first-mortgage bondholders will take possession of the railroad property and organize a new company, in accordance with the plan of reorganization already published. This substantial ending of the long pending troubles enables the Advertiser to publish facts which have been in its possession for several days, but have been withheld because of the pendency of the matter in the court. The negotiations have been in progress since last November, when a proposition was made to Mr. Brooks to purchase his bonds and to secure a foreclosure by agreement, as has just been done. The assent of the various classes of securities was obtained to the reorganization scheme already detailed in these columns, and, after many attempts, a form of mortgage satisfactory to all parties in interest was adopted. Mr. Brooks, deeming some of the terms unfavorable to the interests of the Vermont & Canada, resigned as President and director of that company, as already stated, and Colonel Albert Clarke was elected President. Meantime the possession of Mr. Brooks' bonds was necessary to the carrying out of the foreclosure by the Central Vermont managers, and the negotiations to secure them under the terms at first proposed having failed, a new basis for the transfer was formulated, and several interviews were held between ex-Gov. J. Gregory Smith, President of the Central Vermont, Mr. Brooks and the counsel for both parties. At last a settlement was reached near the end of last week, and Gov. Smith purchased both the Vermont Central bonds and the Vermont & Canada stock owned by Mr. Brooks. This cleared off all obstacles to the completion of the reorganization, and yesterday's decree of foreclosure was the result. The Central Vermont managers will now obtain by the foreclosure of the mortgage of the property on both roads a clear title, and

will organize a new corporation to which the franchise and property of the consolidated line will be transferred, and will probably continue to operate the roads under a lease from the new companies."

Chattanooga.—It is reported that this road has been sold to parties who purpose extending it from its present terminus at Peach Orchard, Ky., southward about 100 miles to a connection with the Norfolk & Western road. The extension will be through a very rugged and difficult country. It is said that the same parties are negotiating for the control of the Cincinnati & Eastern road. The Chattanooga road now runs from Ashland, Ky., on the Ohio River, south to Peach Orchard, 43 miles.

Chicago & Atlantic.—It is announced that through freight trains will begin to run over this road (the Erie's new line to Chicago) on April 2. Through passenger trains will not be put on for a month yet.

Chicago & Eastern Illinois.—In the suit in which the validity of the foreclosure sale of the Chicago, Danville & Vincennes road is announced, Judge Blodgett, at Chicago, March 14, decided against the motion, made in the interest of the old company, to restore the property to the Receiver of the Danville Company, who has never been discharged, holding that the judgment of the United States Supreme Court, reversing the decree of foreclosure, did not necessarily divest the Chicago & Eastern Illinois of the title to the property, and that it has the right to be heard; that the property was abundant to satisfy all that was due under the first mortgage, and that therefore there was not sufficient cause for appointing a receiver. The Court also overruled a motion to refer the case to the Master to ascertain and report the amount of interest due on the bonds as premature. It made the same disposition of a motion to strike from the files a cross-bill of the Chicago & Eastern Illinois in which it asks for a decree in its own behalf, on the ground that it was a bona fide purchaser without notice. On this point Judge Blodgett said:

"If the Chicago & Eastern Illinois was a bona fide purchaser it had the right to a decree removing whatever claim the old corporation or the holders of incumbrances and mortgages made by the old corporation might apparently have on the record as a cloud on the title of the present parties in possession. There was some ground shown for affirmative relief, and the cross-bill would accordingly be retained."

Chicago, Rock Island & Pacific.—This company has published the following statement for the ten months of its fiscal year from April 1 to Jan. 31:

Gross earnings (ten months).....	\$10,090,621
Working expenses (57.51 per cent.).....	5,803,618
Net earnings.....	\$4,287,003
Interest and rentals, ten months.....	1,127,000
Balance.....	\$3,160,003
Add Land Department receipts.....	440,000
Total surplus, ten months.....	\$3,600,003

This surplus is equivalent to 8.57 per cent. on the capital stock. The dividends paid have been at the rate of 7 per cent.

Chicago, St. Louis & Pittsburgh.—The following general notice circular from W. L. Scott, President, is dated Indianapolis, March 21: "The Chicago, St. Louis & Pittsburgh Railroad Company having duly acquired title to the property formerly owned by the Columbus, Chicago & Indiana Central Railway Company, will on April 2 take possession of that property, and thereafter operate the same. * * *

"Communications relating to the business of the company will be addressed to the officers (a list of whom is given elsewhere) in their respective departments. Exchanges of securities, under the plan of reorganization adopted for the company, will be made at its New York office, No. 160 Broadway, and communications relating thereto can be addressed to the President, Treasurer, or Assistant Secretary at that place."

The officers appointed are all officers of the Pennsylvania Company and the Pittsburgh, Cincinnati & St. Louis, so that no change is made in the management of the road.

Cincinnati & Eastern.—The Cincinnati Commercial Gazette says: "A syndicate has been formed which will put the road in good shape, and place it beyond the danger line, as it were."

"The syndicate will issue bonds to the amount of \$2,000,000 at 6 per cent., the proceeds of which will be used in taking up the \$500,000 first-mortgage and \$300,000 second-mortgage bonds. The remainder of the new issue will be used in completing the road to Portsmouth, or beyond to Gallipolis. There are 29 miles yet to build before Portsmouth is reached. The distance from Portsmouth to Gallipolis is 54 miles. The road will be made standard gauge at once. The members of the syndicate are: President McGill, General Manager Woodward, General Superintendent Wilbur and other heavy holders of the Cincinnati & Eastern, who will be joined by Mr. E. W. Woodward and W. H. Clements; also by the principal holders of Chattanooga securities, which will induce Mr. John Carlisle and George Hafer to enter the syndicate. It is the intention to ultimately consolidate the Cincinnati & Eastern with the Chattanooga road, and extend the latter to the great ore-beds of North Carolina and to a connection with the Norfolk & Western, which will give Cincinnati another deep-water connection. The stocks and bonds of the Cincinnati & Eastern will be sold in blocks, with a percentage of stock as a bonus."

Cincinnati, New Orleans & Texas Pacific.—This company, operating the Cincinnati Southern road, has made an agreement with the Louisville & Nashville Co. to run both freight and passenger trains between Louisville and Chattanooga, the connection being made at Danville Junction, Ky., where the Knoxville Branch of the Louisville & Nashville crosses the Southern road. This route makes the distance from Chattanooga to Louisville 312 miles, or 23 miles less than from Chattanooga to Cincinnati. It is also the most direct line from Louisville to Chattanooga, being 24 miles shorter than the route by way of Nashville. The agreement has made a good deal of talk in Cincinnati, where people complain that it is giving Louisville all the advantages which Cincinnati has spent so much to secure.

Cincinnati Northern.—The stockholders of this company met in Cincinnati, March 24, and voted to ratify the consolidation of the company with the Toledo, Cincinnati & St. Louis. The terms of the consolidation have not been made public. Complaint is made by some of the stockholders that no proper notice was given of the meeting, and that the hour and place of meeting were not given, so that they were unable to find out anything until after the meeting was over.

Cincinnati, Washington & Baltimore.—The contract for the sale of the Cincinnati & Baltimore road to this company has been ratified, in accordance with the plan of reorganization. The Cincinnati & Baltimore road, which has hitherto been leased, forms the entrance of the road into the city of Cincinnati.

Cleveland, Tuscarawas & Wheeling.—The special master appointed on the application of Clement Russell, of Massillon, is now employed in taking testimony as to the \$628,000 bonds alleged in Mr. Russell's complaint to have been illegally issued. It is charged that these bonds were pledged to secure a loan of \$210,000, and that they were finally sold for the amount of the loan and interest. The Court has confirmed the sale of the road under foreclosure, as already noted, and it has been transferred to the Cleveland, Lorain & Wheeling Co., organized by the purchasers.

Council Bluffs & Northern.—This company has been organized to build a railroad from Council Bluffs, Ia., north by east to Storm Lake on the Illinois Central, about 100 miles.

Eastern.—At the special meeting in Boston, March 28, the stockholders ratified the lease of the road to the Boston & Maine Co., by a vote of 35,267 shares in favor of 1,060 opposed.

The stockholders also voted to accept the act authorizing the issue of preferred stock in exchange for certificates of indebtedness.

Grand Rapids & Indiana.—At a meeting of the board of directors held March 27, it was decided, in view of the suit begun by the Pennsylvania Railroad Co. to recover on the coupons which it has paid for this company under agreement, to suspend payment of all coupons until further orders from the board, or until some order is made by the Court in the case. This decision will prevent the payment of the coupons due April 1 on the unguaranteed first-mortgage bonds.

Grand Trunk.—A special dispatch from London to the Toronto (Ont.) Globe says that the report of this company from Aug. 12, the date of consolidation, to Dec. 31 has been issued. The gross receipts as compared with those of the corresponding period in the previous year show an increase of 14 per cent. The working expenses have decreased 6 per cent.

The directors propose at an early date to invite subscriptions for \$750,000 perpetual 4 per cent. debenture stock for the redemption of preference securities now maturing and to provide for other capital requirements. The President will submit at a meeting the views of the board respecting the consolidation of the debenture and other stocks of the company and the separation of contingent for the more immediate rights of the share capital.

Illinois Midland.—Arguments and testimony are now being heard before a special master on the question of the validity of the receivers' certificates, of which about \$1,300,000 have been issued. Their validity is questioned by some of the bondholders.

Indiana, Bloomington & Western.—The back-pay claims, about which there has been much litigation both before and since the sale of the road under foreclosure and its transfer to the present company, are now finally settled, with the exception of a few which have not been presented. The amount of these claims, which were assumed and now finally paid by the present company, was about \$254,000, and over \$244,000 have been paid out.

Indiana, Illinois & Iowa.—Track is now laid to Shelby, Ind., 6 miles eastward of Sugar Creek, the last point reported, 17 miles from Muncie, and 79 miles from the Western terminus at Streator, Ill. Trains will soon run to Shelby, where connection is made with the Louisville, New Albany & Chicago.

Iron Valley & Morgantown.—Work has been begun on this road, which is to run from the Baltimore & Ohio road northeast to Morgantown, W. Va., and thence north to the Pennsylvania line.

Jacksonville & St. Augustine.—Track on this road is now laid from the starting point on the St. Johns River opposite Jacksonville, Fla., south by east 20 miles. The remaining 19 miles to St. Augustine are all graded, and it is expected that the road will be finished in another month.

Kentucky Union.—Surveys are being made for the first section of this road, which is to extend from the Chesapeake & Ohio near Winchester, Ky., to the Red River Mills in Powell County. This section will be about 20 miles long, and will reach several large saw-mills.

Lackawanna & Pittsburgh.—The consolidation of the Allegheny Central and the Lackawanna & Pittsburgh companies, under the name of the Lackawanna & Pittsburgh Railroad Company, was ratified by the stockholders of both companies March 24. The consolidated company has 62 miles of road completed, to which 58 miles more are to be added this season. Its main line will run from the New York, Lackawanna & Western, at Perkinsville, to Olean. The consolidated company will issue \$1,500,000 preferred stock, of which \$1,000,000 will be exchanged for the present stock of the Allegheny Central.

Lake Shore & Michigan Southern.—At a meeting of the board of directors in New York, March 27, it was decided to declare the usual quarterly dividend of 2 per cent. No statement of the operations of the road for this quarter was made public.

Long Island.—This company has filed a map for the extension of its road from the present terminus at Atlantic and Flatbush avenues in Brooklyn to the terminus of the East River Bridge approach. The purpose is to build an elevated road from the bridge to East New York.

Louisville, Evansville & St. Louis.—This company, whose line from New Albany, Ind., to Mount Vernon, Ill., and Evansville, was finished last year, asks its bondholders to fund their coupons for two years, in order that the earnings may be used to settle floating debt and buy equipment. The road is chiefly owned in Boston.

Louisville, New Albany & Chicago.—The Indianapolis & Chicago Air Line Division was opened for traffic through to Indianapolis on March 24. One passenger train each way is now run to do the local business, but a second passenger train will be put on as soon as the new cars ordered are received.

Manhattan.—The New York Railroad Commissioners have begun an investigation into the actual cost of the elevated lines in New York now leased and worked by this company. Thus far they have been chiefly occupied in examining the officers of the New York Loan & Improvement Co., which built the Metropolitan Elevated lines.

Michigan Central.—At a meeting of the board in New York, March 27, no dividend was declared, but the following resolutions were passed:

"Whereas, The agreement between the Michigan Central Railroad Co. and the Canada Southern Railway Co., under date of Dec. 12, 1882, provides for semi-annual accounts of the business of the two companies, and although the earnings of the two companies for the quarter ending March 31, 1883, are sufficient to pay a dividend on their respective capital stocks, it is considered most advantageous to the interest of both companies that the dividends should hereafter be paid semi-annually; therefore,

"Resolved, That hereafter the dividends of this company be payable on or about Aug. 1 and Feb. 1 in each year."

Morris & Phillipsburg.—This company has filed articles of incorporation to build a railroad from a point on Moshannon Creek in Morris township to a point near Beaver Run in Decatur township, both in Clearfield County, Pa. The road will be about 7 miles long.

New York, Lake Erie & Western.—This company's statement for January and the four months of the fiscal year from Oct. 1 to Jan. 31 is as follows:

	January.	Four months.
Earnings.....	\$1,524,869	\$6,854,106
Expenses.....	1,220,292	4,707,256
Net earnings.....	\$304,577	\$2,146,850
Per cent. of expenses.....	80.02	68.68

For the four months there was an increase of \$433,566, or 6.8 per cent. in gross earnings; an increase of \$116,141, or 2.5 per cent., in expenses, and an increase of \$317,425, or 17.4 per cent., in net earnings.

New York, West Shore & Buffalo.—This company has made an agreement with the Delaware & Hudson Canal Co. for an exchange of traffic, the running of trains between New York and Saratoga and for the joint use of certain terminal property in Albany. The negotiations gave rise to reports of a lease of the West Shore road to the Delaware & Hudson, which have been contradicted.

Tracklaying has made considerable progress lately and it is though probable that one track may be completed from Weehawken to Syracuse by the end of April.

Norfolk & Western.—This company's statement for February and the two months ending Feb. 28 is as follows:

	February.	Two months.
Earnings.....	\$191,345	\$391,832
Expenses.....	116,340	238,949
Net earnings.....	\$74,999	\$152,883
Per cent. of expenses.....	60.82	60.99

For the two months there was an increase of \$78,601, or 23.1 per cent., in gross earnings; of \$40,783, or 20.6 per cent., in expenses, and of \$37,818, or 27.3 per cent., in net earnings.

Northern Pacific.—This company has bought two tracts of land in St. Paul, Minn., comprising about 400 acres in all, which are to be used for freight stations and yards, elevators, stock-yards and other terminal conveniences and for the erection of repair shops. A portion of the land will be reserved for a slaughter-house and packing-house. It is thought that the land will be sufficient for all the necessities of the road for many years to come.

Ogdensburg & Lake Champlain.—In the long pending suit between this company and its connections through New Hampshire, the Northern (New Hampshire) Co. has filed a cross-bill asking to have the old contracts reformed, in order that they may express the true intent of the contracting parties at the time they were made.

Oregon Improvement Co.—The financial statement of this company for January and the two months of the fiscal year from Dec. 1 to Jan. 31 is as follows:

	January.	Two months.
Earnings.....	\$240,543	\$511,732
Expenses.....	108,429	208,308
Net earnings.....	\$132,114	\$303,424

For the two months there was an increase of \$40,291, or 8.6 per cent., in earnings; an increase of \$24,996, or 6.7 per cent., in expenses, and an increase of \$15,295, or 15.6 per cent., in net earnings.

Painesville & Youngstown.—The first-mortgage bondholders have begun foreclosure proceedings, and have deposited their bonds with a committee, which is to conduct the suit and to buy in the road. Negotiations are in progress for the transfer of the property after reorganization to parties in the interest of the New York, Chicago & St. Louis. The line will be changed to standard gauge, and will be used to form connections for Cleveland and to Pittsburgh.

The road is now of 3 ft. gauge, and extends from Fairport, O., to Youngstown, 63 miles.

Pennsylvania.—The lease of the Philadelphia, Germantown & Chestnut Hill road to this company has been ratified, and also the issue of \$1,000,000 bonds on the leased road, to bear 4½ per cent. interest and to be guaranteed by the lessee. The road, on which work has just been begun, is the first section of the Pennsylvania's new line to Reading.

At the annual election on March 27 all the old directors were re-elected without serious opposition, a few thousand shares being voted for a Mr. Parker.

The company's statement for February shows for that month, as compared with February, 1882, on all lines east of Pittsburgh and Erie:

An increase in gross earnings of.....	\$405,465
An increase in expenses of.....	148,392
Net increase.....	\$257,073

For the two months ending Feb. 28, as compared with the corresponding period in 1882, the same lines show:

An increase of gross earnings of.....	\$961,501
An increase in expenses of.....	207,630
Net increase.....	\$753,865

All lines west of Pittsburgh and Erie for the two months of 1883 show a surplus over all liabilities of \$10,205, being a gain of \$67,654 as compared with the corresponding period last year.

Pennsylvania, Slatington & New England.—A dispatch from Harrisburg, Pa., March 27, says: "On the suggestion of the Attorney-General, President Judge Simonton has awarded a writ of *quo warranto* against the Pennsylvania, Slatington & New England Railroad Co., returnable on April 23. The suggestion of the Attorney-General sets forth that the said company has claimed for the past year, and yet claims, to have, without any lawful warrant within this commonwealth, the franchises, liberties and privileges of a railroad. Wherefore the Attorney-General suggests that the Court here award the commonwealth a writ of *quo warranto* directed to the Sheriff of Northampton County, summoning the company to appear here and show by what warrant it claims to have the franchises, liberties and privileges of a railroad. The same action has been taken in regard to the Delaware & Slatington Railroad Co., the writ to be returnable on the same day, April 23."

The hearing in the equity suit to determine the rights of the two companies to the use of the track between Bangor, Pa., and Penargyl has been postponed from March 27 to April 5.

Philadelphia & Reading.—The Special Master has filed his report setting forth the transfer of the property by the Receivers to the company. All property, money, etc., has been turned over or accounted for, except a balance of \$17,534, which has been applied in payment of claims for which the vouchers had not yet been received in the ordinary course of business. The Master will make a final report in relation to this balance.

The final statement of the Receivers for February and the

three months of the fiscal year from Dec. 1 to Feb. 28 is as follows:

	Gross.	Net.	Three months.
Railroad traffic.....	\$1,405,267	\$623,010	\$2,133,167
Canal traffic.....	2,821	*14,453	*55,834
Steam collieries.....	4,041	18,355	60,259
Richmond barges.....	2,733	*816	*3,545
Total Railroad Co.....	\$1,453,862	\$636,096	\$2,140,047
Coal & Iron Co.....	923,319	3,083	*1,305
Total.....	\$2,377,181	\$639,081	\$2,138,742

Total, 1882:			
Railroad Co.....	415,092		1,870,706
Coal & Iron Co.....	22,564		152,406
Total.....	\$437,656		\$2,023,112

*Deficit.

This shows for both companies for February an increase in net earnings of \$191,425, or 43.6 per cent., and for the three months a net increase of \$115,630, or 5.7 per cent.

Plymouth County.—Meetings are being held to advocate the construction of this road, which is to run from the New York & New England at Readville, Mass., through Stoughton, Brockton, Abington, Rockland and Hingham to a connection with the Nantasket Beach road. The line will be about 30 miles long.

Pontiac & Pacific Junction.—This company has placed in London an issue of first-mortgage bonds, guaranteed by the Province of Quebec, at the rate of \$20,000 per mile. Work will soon be begun on the line from Ottawa, Can., to Pembroke, which was partly graded last year.

Pottsville & New York.—Arrangements are to be made to begin work shortly on this road. It is to run from Schuylkill Haven, Pa., east by north to Lehigh Gap in Carbon County, where it will connect with the Lehigh Valley road. The line will be about 30 miles long, and will give the country about Pottsville an outlet independent of the Reading road.

Richfield Springs.—A survey has been completed for this proposed road from Richfield Springs, N. Y., northward to the New York Central at Fort Plain. The distance is 21½ miles and a very good route has been found.

St. Louis, Iron Mountain & Southern.—The track on the White River Branch is now completed to Batesville, Ark., 26 miles westward from the junction with the main line at Kerrigan. Shipments of freight from Batesville, which is the centre of a cotton district, have been begun.

St. Louis & San Francisco.—This company's White River Branch is now completed and opened for business to Sparta, Christian County, Mo., 28 miles southward from the main line at Springfield. The stations on the branch are Langston, Galloway, Cassidy, Ozark and Sparta.

Schuylkill & Lehigh.—Arrangements had been made to begin a suit to foreclose the mortgage on this road, which is worked by the Philadelphia & Reading Co. The rental is the net earnings of the road, and these have not been sufficient to pay interest. It is now announced that a compromise has been arranged, the bondholders agreeing to accept \$900,000 new bonds in place of the \$1,000,000 present bonds, and the Philadelphia & Reading Co. on its part agreeing to pay 4½ per cent. on the reduced amount for interest up to May 1 next, and 4½ per cent. yearly thereafter.

Securities on the New York Stock Exchange.—The Governing Committee of the New York Stock Exchange has put on the lists the following:

Chicago, St. Paul, Minneapolis & Omaha, \$756,000 additional 6 per cent. 50-year consolidated mortgage bonds, numbered 20,202 to 20,957, inclusive.

Southern Pacific.—It will be remembered that the terrible accident at Tehachapi on Feb. 20 last was attributed to the carelessness of the trainmen in leaving the train while the engine was detached. Patton, one of the brakemen, was indicted for manslaughter, but his trial at Bakersfield, Cal., has just ended in his acquittal.

Susquehanna & Southwestern.—This company has filed articles of incorporation in Maryland, to build from the Pennsylvania line southward to the Baltimore & Ohio at Hancock. It is the extension of a Pennsylvania project.

Texas, Topolovampo & Pacific.—An engineer who has crossed Mexico on the proposed route of this railroad from the Rio Grande to the Pacific coast writes us that a practicable crossing of the Sierra Madre for a railroad with a 1 per cent. grade (52.8 ft. per mile) at a height, by the barometer, 7,025 ft. above the level of the sea. Before this reconnaissance it was not known that a crossing practicable for a railroad could be found.

Union Pacific.—A dispatch from Boston, March 27, says: "The full bench of the Supreme Court is engaged to-day in hearing arguments on questions of law arising on the bill in equity brought by the Union Pacific Railroad Company against the Credit Mobilier of America, for an injunction to restrain the Credit Mobilier from prosecuting a suit at law against the Union Pacific Company to recover a balance due the Credit Mobilier for the construction of 246 miles of the Union Pacific Railroad. The amount involved is \$1,998,000, which was the sum agreed upon as a basis of a settlement of accounts between the two corporations after the Credit Mobilier had finished building the road, and a further sum of \$268,000, which was subsequently found to be due the Credit Mobilier."

This company's statement for January is as follows:

	1883.	1882.	Inc. or Dec.	P. c.
Earnings.....	\$1,586,535	\$2,186,020	D. \$199,485	9.1
Expenses.....	1,084,913	1,413,039	D. 328,126	23.0

Net earnings..... \$501,622 \$769,981 I. \$131,641 17.1

The expenses were 51.60 per cent. of gross earnings this year, against 64.78 per cent. in January of last year.

Utica, Clinton & Binghamton.—The Delaware, Lackawanna & Western Co., which has worked this line for several years as agent for the Delaware & Hudson Canal Co., lessee, will turn the road over to the latter company on April 2.

Western Union Telegraph.—In the Reiff suit to enjoin this company from completing the lease of the Mutual Union Telegraph lines, the New York Superior Court has given a decision which is, in effect, that the lease is not illegal, but that it should have been ratified by the stockholders at a meeting called for the purpose, instead of by assents in writing. The preliminary injunction is therefore continued until further trial of the suit, or until a meeting is called and the lease ratified according to the law.

Woodruff Sleeping & Parlor Coach Co.—This company has now 77 of its sleeping and parlor cars in service. The capital account, representing the cost of these cars and appurtenances, is \$776,744. For the year ending Nov. 30 last the earnings of the company were \$89,411; the expenses, interest and dividends amounted to \$68,932, leaving a surplus of \$22,509 to the current year.